February 1959

Cost-saving formula for buildings

p. 34

Railway TRACK and STRUCTURES

Graphic method for stringlining curves

p. 31

A Simmons-Boardman TIME-SAVER Publication

ONE DOSAGE of DRY Nalco H-174 for ALL-YEAR WEED CONTROL

Low dosage — usually a small fraction of that of other "apply dry" formulations — is a big advantage you get with H-174. And it's easily explained: Nalco H-174 has an unusually high concentration of powerful killing ingredient. *You get much more killing power with much less chemical to transport and apply!*

Nalco H-174 is effective whenever you apply it, but you can get full advantage from this powerful herbicide by spreading a single dosage about 2 weeks *before* weeds begin to emerge. H-174 will keep them down all year long, eliminating unsightly and inflammable weed debris, preventing re-growth and mid-season seeding.

Spreading *dry*, granular Nalco H-174 is a fast, simple operation. No mixing, spraying, or dilution . . . ready to use as it comes from bag or convenient shaker box . . . distribute by hand or with mechanical spreaders . . . For better weed control, plan on using Nalco H-174!

H-174 is one of a complete line of Nalco weed control chemicals, both dry and liquid, in wide use by railroads and industries throughout the world.

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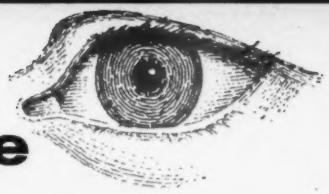

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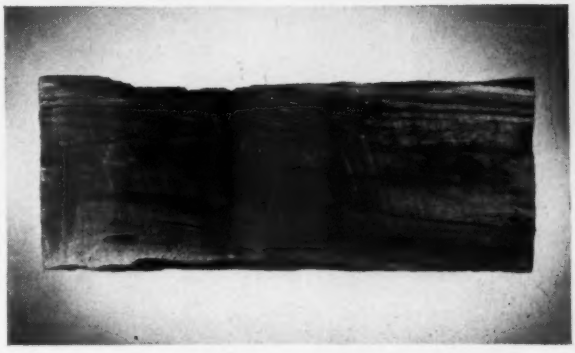
SELF-SEALING TIE PADS

SOUND WOOD AFTER 15 YEARS OF BIRD TIE PAD PROTECTION

This tie, installed in 1926, was protected by Bird Self-Sealing Tie Pads from 1942 to 1957. It was then removed from track and slabbed for exhibition purposes. See how the Bird Tie Pad is still securely sealed to the tie after 15 years. Note the soundness of the wood in the under-plate area.



COSTLY DETERIORATION IN UNPROTECTED TIE

This tie, also installed in the same track in 1926, was not protected by Bird Self-Sealing Tie Pads. When the tie was removed and slabbed for exhibition purposes in 1957, it had been seriously damaged by moisture and abrasive wear. The deterioration in the tie plate area is especially noticeable.

Bird Self-Sealing Tie Pads are the *only* tie pads whose durable and effective seal with the tie has been proved by years of in-track service. For additional proof of dollar savings, send for free booklet to Bird Tie Pads, East Walpole, Mass., Department HTS

Bird Self-Sealing Tie Pads are Recommended for:

BRIDGE DECKS • CURVES • SWITCH TIES • HIGHWAY GRADE CROSSINGS AND OTHER PAVED AREAS • CROSSING FROGS • INSULATED JOINTS • WITH SMALLER TIE PLATES • PILE CUTOFFS • THROUGH-STATION PLATFORMS • OUT-OF-FACE INSTALLATIONS IN RAIL-LAYING PROGRAMS • SANDY LOCATIONS • ALL OTHER AREAS WHERE TIE LIFE IS SHORT OR REPLACEMENT COSTS HIGH.

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Lease and optional purchase plans available.

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RAILWAY

TRACK and STRUCTURES

Published monthly by the

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DON'T MISS . . .

What the Pennsylvania calls its "M/W machinery committee" is a key factor in this road's selection of work equipment. The story of this committee—its function, who's on it, how it operates—will be one of the many features of our Equipment Economies Number.

. . . in the March issue

FAIRMONT

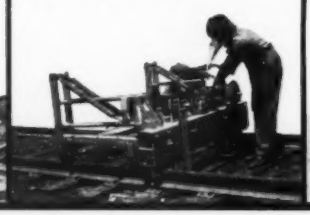
removes ties at the rate of one per minute!

Save both time and labor by using the FAIRMONT W68 A TIE REMOVER. The machine removes 50 to 80 old ties in one hour without jacking track. And with the new automatic rail hook attachment shown in the picture above, it takes only one man to operate the machine. Automatic rail hooks are available as an extra and can be fitted to your present Fairmont tie remover quickly and easily.

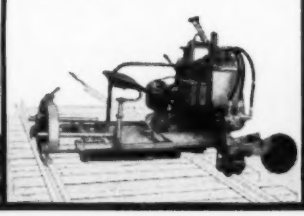
The smooth operation of the W68 saves on ballast, too! A hydraulic ram with a pushing force up to 16,000 lbs. does the work quickly and neatly. Many renewals can be made without track surfacing. Pneumatic set-off wheels let you move the machine on and off the track at will. Rugged construction and a minimum of moving parts assure maximum dependability . . . long operating life . . . low upkeep. Write today for complete details on the many advantages you get with a Fairmont W68 Tie Remover.

W84 SERIES B HYDRAULIC SPIKE PULLER is primarily for use in tie gangs. Will pull from either rail without change-over.

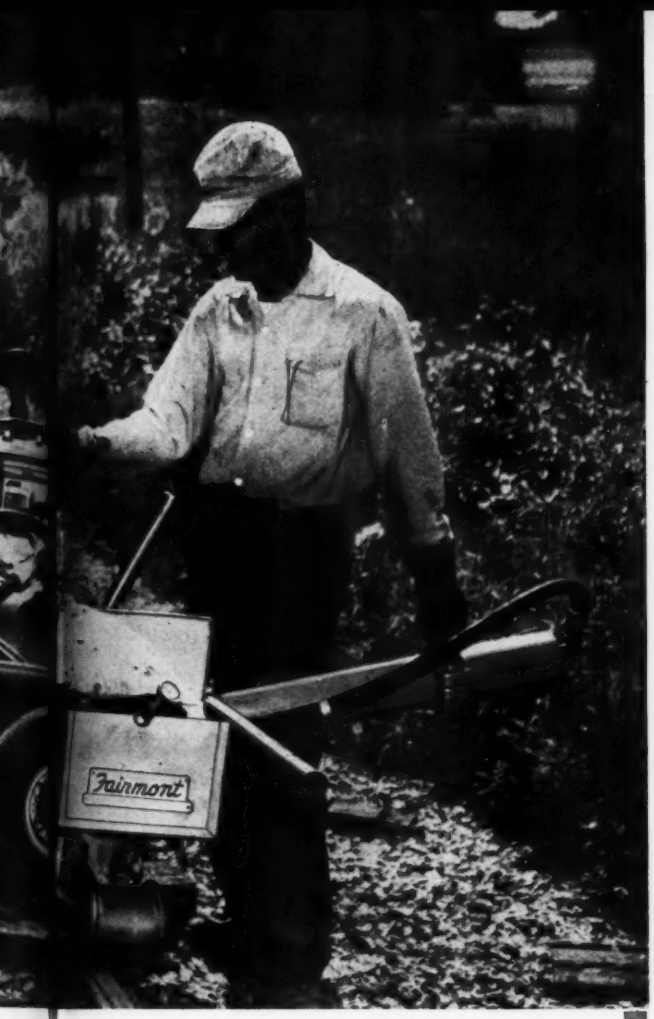
W86 SERIES B HYDRAULIC RAIL LIFTER makes the job of removing or inserting tie plates a quick and easy one.



W90 SERIES A TIE HANDLER inserts or removes ties quickly and requires only two men for operation. Self-propelled.



W87 SERIES B TIE BED SCARIFIER digs a new tie bed in less than a minute. Self-propelled, hydraulic operation, one man control.



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50

LEADER

FOR HALF A CENTURY

Hundreds of Fairmont-built units are reducing tie renewal costs on American railroads.

Fairmont

RAILWAY MOTORS, INCORPORATED

FAIRMONT, MINNESOTA

Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

HIGH SILICON RAIL. A new booklet (RP453-5M-12-58) tells the story of the development of Hi-Si rails and the advantages of using them. The two-color booklet tells why investigation was made into the use of a greater quantity of silicon in the manufacture of rail steel than that specified by AREA specifications. It also describes the test installations that have been made in track as well as experiments that have been conducted in the laboratory. Comparisons of the amount of wear between the theoretical sections of Hi-Si rail and standard carbon rail under various conditions of climate, traffic and track are presented. (Write: *The Colorado Fuel & Iron Corp., Dept. RTS, Denver, Colo.)*

EARTHMOVING EQUIPMENT. A booklet is available which explains the parts-exchange program of Caterpillar dealers. The 8-page, 3-color publication is entitled "Exchange Down Time for Go Time" and describes, with cartoon-type illustrations, the advantages of this program in getting a machine back on the job through the replacement of assemblies with dealer-rebuilt units. The booklet, D848, follows the exchange part through the rebuilding procedure, including the inspection of its component parts. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS, Peoria, Ill.)*

BRUSH KILLERS. A new folder describes the Diamond Line Rider Formulations for controlling weeds and brush along railway rights-of-way. The 4-page folder gives various formulations of 2,4-D and 2,4,5-T of both low-volatile and regular esters and amine salts. Included are recommended or suggested uses for each product. (Write: *Diamond Alkali Company, Dept. RTS, 300 Union Commerce Building, Cleveland 14, Ohio.)*

ALUMINUM FENCING. A comprehensive review of aluminum's role in the fence market is presented in a new booklet. The new 12-page booklet is entitled "Chain Link Fencing of Alcoa Aluminum" and outlines details of actual highway, industrial and municipal installations of this product. Complete technical data are given on strength, durability and resistance to corrosion. Also included are suggested aluminum alloys and the tensile strength of the product after 20 years of exposure. A companion publication is also available which suggests specifications for the product. (Write: *Aluminum Company of America, Dept. RTS, Alcoa Building, Pittsburgh 19, Pa.*

OVERHEAD CRANE. Bulletin 91 describes and illustrates the new Whiting Thrif-T Crane. Entitled "Keep Your Capital Investment Down," the 6-page folder tells how the crane was designed to provide economical materials handling. Specifications of the Thrif-T crane are included. The bulletin also contains information on the specific features as well as construction details. Recommended applications for the crane are given. *(Whiting Corporation, Dept. RTS, 157th and Lathrop Ave., Harvey, Ill.)*

MOBILE CRANE. The Silent Hoist Rail-O-Road Krane Kar is described and illustrated in a bulletin now available. Bulletin 68B shows the machine operating on both its flanged wheels and its rubber-tired wheels doing a variety of jobs. Its applications in maintenance of way work are stressed. Features of the Krane Kar are pointed out and detailed specifications are given. Model numbers and capacities are included along with extra equipment available. (Write: *Silent Hoist & Crane Co., Dept. RTS, 841-877 63rd St., Brooklyn 20, N. Y.)*

CONSTRUCTION EQUIPMENT. A new catalog is available which shows special equipment for Allis-Chalmers' crawler tractors and motor graders. The 12-page two-color catalog, MS-1189, describes and illustrates the attachments and accessories which are designed to increase the versatility and working capabilities of the machines. Also included are descriptions of equipment which are planned to add to the operator's comfort and safety under normal or unusual working conditions. (Write: *Allis-Chalmers Manufacturing Company, Construction Machinery Division, Dept. RTS, Milwaukee 1, Wis.)*

Dear reader:

RAILWAY
TRACK and STRUCTURES

The need today for flexible thinking

Maintenance-of-way men are frequently heard discussing the policies of their particular roads. Our policy is this or that, they will say, referring to a particular aspect of their work, such as basic organization, work practices, or the use (or non-use) of a machine, a device or a material.

It is necessary, of course, to have a policy. Chaos would result if there were no policies governing M/W operations. But at the other extreme, and to be equally shunned, is a rigid policy. The danger of the latter type of policy is obvious. Never was it more dangerous than today when new developments are occurring so rapidly and when the need for economy is so great.

It would be difficult, if not impossible, to find a maintenance-of-way man who would disagree with the statement that a rigid policy is dangerous. It would be almost as difficult to find one who would admit that his road is following a rigid policy in any respect. But therein lies another, and even more insidious, danger. For it is possible to have an inflexible attitude without realizing it.

We can use a hypothetical example to explain this point. Suppose your company has an established policy against the use of a certain product or machine. Suppose further that this policy was established as the result of tests that were conducted several years ago. Are the results of those tests going to determine the policy toward that particular product for all time? Or will consideration be given to the possibility that the product may have been improved in the meantime? Or that conditions have changed in such a way that the product, formerly judged to be uneconomical, would now produce worthwhile savings if placed in use?

Changing conditions, particularly rising wages, have a profound effect on the economy of practices, products or machines. What was economical yesterday may be prohibitively expensive today. What was uneconomical yesterday may be a source of important savings today.

There's nothing new or novel about these thoughts. The truth behind them is generally recognized. Why, then, should we make such a point of the matter? The reason is that recognition of a truth does not necessarily mean that the truth will be acted upon or put into practice.

Take a particular railroad as an example—your road. Doubtless a good case can be made for the argument that a progressive policy is followed by the maintenance-of-way forces. Now let's suppose that an exhaustive and objective study is made of its M/W practices. Who would care to wager that opportunities for new economies would not be found? Admittedly this example makes use of a somewhat exaggerated stratagem, but the point it makes is inescapable.

What all this adds up to is that constant re-evaluation of practices is the only way to assure that the maintenance-of-way forces can be kept at a peak of efficiency today. This means, of course, flexible thinking and flexible policies.

MHD

CATERPILLAR'S PROJECT PAYDIRT

***PROJECT PAYDIRT** pays off for you*

NEW CAT D8 TRACTOR SERIES H

BULLDOZING: PRODUCTION UP... PUSHLOADING: PRODUCTION UP

HORSEPOWER INCREASED 18%—up to 225 from 191 (flywheel).

DRAWBAR HORSEPOWER—up to 180 from 155.

SIZE INCREASED—weight up approximately 4,400 lb. to 47,000 lbs., gauge widened to 84 inches.

LIFETIME-LUBRICATED ROLLERS AND IDLERS—never need further lubrication until rebuilding.

NEW, STRONGER, HEAVIER UNDERCARRIAGE—every component stronger through improved materials and heat treat processes.

SIX DIRECTLY REVERSING SPEEDS—high forward is 6.3 MPH, reverse is 6.4 MPH (direct drive).

DRY-TYPE AIR CLEANER—removes 99.8% of dirt in intake air even under severe operating conditions.

GREATER STABILITY—with 5,505 square inches of track on ground.

BETTER VISIBILITY—new seat placement, location of console-type controls increases operator efficiency.

DEPENDABLE OIL CLUTCH—key retained feature for direct drive; practically eliminates clutch down time.

The new Caterpillar D8 Series H Tractor is ready *now* to increase its lead as undisputed king in its size class. A major achievement of Caterpillar's all-out research program, "Project Paydirt" (see box), the new D8 has been proved by a rigorous field testing program.

This D8 is new in design, appearance and performance. It is bigger, more powerful. It incorporates dramatic new engineering advances. It is easier to operate. And *more economical* to own.

Get the full story from your Caterpillar Dealer. Then *see* this great new machine at work on your job. You can't afford not to!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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BORN IN RESEARCH... TESTED IN THE FIELD

CATERPILLAR'S PROJECT PAYDIRT

PROJECT PAYDIRT: Caterpillar's multi-million-dollar research program — to meet the coming challenge of the greatest construction era in history with the highest production earthmoving machines ever developed.

News about people

CANADIAN PACIFIC—J. S. Smith has been appointed district engineer of the Algoma district with headquarters at North Bay, Ont., succeeding **N. B. Roberts** whose promotion to assistant regional engineer was announced in the December issue.

FLORIDA EAST COAST—J. M. Wolfe, principal assistant engineer at St. Augustine, Fla., has been promoted to assistant chief engineer there. **J. D. Free,** assistant engineer at St. Augustine, has been promoted to construction engineer at that location.

FRISCO—O. E. Fort, assistant chief engineer maintenance at Springfield, Mo., has been appointed assistant chief engineer, Eastern district, there. **J. H. Brown,** assistant chief engineer construction at Springfield, has been named assistant chief engineer, Western district, at the same location.

ILLINOIS CENTRAL—P. H. Croft, Jr., assistant engineer, has been promoted to supervisor trains and track on the Bloomington and Pontiac districts, with headquarters at Kankakee, Ill., succeeding **A. A. Witter,** deceased. **A. E. Burford,** general foreman bridges and buildings of the Memphis Terminal division at Memphis, Tenn., has been promoted to supervisor bridges and buildings there. His former position is abolished.

NICKEL PLATE—Leroy J. Goodman, assistant engineer at Cleveland, Ohio, has been promoted to division engineer of the Buffalo-Cleveland divisions with headquarters at Conneaut, Ohio, succeeding **Ernest P. Taylor,** retired.

SOUTHERN—Frank M. Kaylor, division engineer at Greensboro, N. C., has been appointed superintendent of the Charleston division with headquarters at Charleston, S. C., succeeding **Carl S. White, Jr.**

VIRGINIAN—W. D. Taylor has been appointed assistant to chief engineer, with headquarters at Norfolk, Va., succeeding **J. D. Hudson,** retired.

WESTERN MARYLAND — Edward P. Wiseman, director of valuation, has retired after 43 years of service. **Nelson Hammond** has been appointed valuation engineer with headquarters at Baltimore, Md. These other recent promotions have occurred: **J. A. Awalt,** chief clerk, to valuation assistant; **W. C. Ingham,** assistant engineer, to senior assistant engineer; **L. C. Byers,** junior engineer, to assistant engineer.

D. E. Pergrin
PRR

J. A. Noble
Santa Fe

Obituary

Alfred C. Clarke, retired chief engineer of the Baltimore & Ohio, died recently at Vero Beach, Fla.

Biographical briefs

David E. Pergrin, 41, who was recently promoted to regional engineer on the Pennsylvania at Indianapolis, Ind. (*RT&S,* Nov., p. 10), was born at Elizabeth, N. J., and graduated from Pennsylvania State College in 1940 with a Bachelor of Science degree in civil engineering. In July 1940 Mr. Pergrin entered the service of the Pennsylvania as an assistant on the engineering corps at Lancaster, Pa. He entered the armed services in May 1941 as a second lieutenant in the U. S. Army Engineer Corps, serving in the European Theatre of Operations as commander of the 291st Engineer Combat Battalion. After his return to the Pennsylvania in February 1946, he was appointed an assistant on the engineering corps at Harrisburg, Pa. Mr. Pergrin was appointed assistant supervisor in April 1946 at Rochester, Pa., being promoted to supervisor track at Lockhaven later that year. While serving in that capacity at Altoona he was further promoted to assistant division engineer at Columbus, Ohio, in September 1952. Two years later he was advanced to engineer maintenance of way and structures at Washington, D. C. In November 1955 he was appointed district engineer at Cleveland, Ohio, being transferred to Columbus five months later, the position he was holding at the time of his recent promotion.

T. J. Boyle, who was recently promoted to assistant engineer of bridges of the Canadian Pacific at Montreal, Que. (*RT&S,* Jan., p. 10), graduated from the University of Saskatchewan in 1937 with a degree in civil engineering. In the years immediately after his graduation he served as an instructor of engineering and engaged in survey, design and construction work in several Canadian provinces. He entered the service of the Canadian Pacific in 1946 as an assistant engineer at Montreal. In 1955 he was appointed special engineer dealing with matters relating to the construction of the St. Lawrence Seaway, the position he held at the time of his recent promotion.

Joseph B. Hartranft, 32 who was recently promoted to supervisor track on the Pennsylvania at Steubenville, Ohio (*RT&S,* Nov., p. 10), was born at Washington, D.C., and graduated from the Rensselaer Polytechnic Institute in 1947 with a Bachelor of Science degree. In 1948 he received a Bachelor's degree in civil engineering. He entered the service of the Pennsylvania in 1948 as a junior engineer at Perry, Pa., later being transferred to Altoona. In January 1949 he was appointed assistant supervisor track at York and was transferred to Steubenville, Ohio, later that year. Mr. Hartranft served as a lieutenant in the Civil Engineer Corps of the U.S. Navy from November 1950 to 1952. Returning to the Pennsylvania in November of that year, he was appointed assistant supervisor track at Perryville, Md. He was promoted to supervisor track at Kittanning, Pa. in 1953 and two years later was appointed assistant engineer at Altoona, the position he was holding at the time of his recent promotion.

Joseph A. Noble, 70, who recently retired as chief engineer of the Western Lines of the Santa Fe at Amarillo, Tex. (*RT&S,* Jan., p. 10), was born at Bonham, Tex., and received his higher education at the University of Texas. Mr. Noble entered the service of the Santa Fe in 1910 as a rodman at Center, Tex. Subsequently he served as levelman, transitman, location engineer and assistant bridge inspector at various locations. He became a draftsman at Amarillo in 1914 advancing to chief clerk to chief engineer there a year later. In 1917 Mr. Noble entered the U. S. Army serving as a captain in the Engineer Corps. He returned to the Santa Fe in Sept. 1919 and was appointed division engineer at La Junta, Colo. In 1930 he was transferred to the Pecos division at Clovis, N. M., serving there until July 1943 when he was promoted to district engineer at Amarillo. In September of that year he was promoted to chief engineer of the Western Lines, the position he held at the time of his recent retirement.

J. M. Bentham, who was recently promoted to engineer of track of the Canadian Pacific at Montreal, Que. (*RT&S,* Jan., p. 10), was born at Montreal, and graduated from McGill University with a degree in engineering. He entered the service of the Canadian Pacific in 1947 as a bridge inspector. The following year he was promoted to assistant engineer. In 1955 he was advanced to assistant engineer of bridges, the position he held at the time of his recent promotion.

Richard P. Howell, 31, who was recently promoted to assistant district engineer on the Pennsylvania at Harrisburg, Pa. (*RT&S,* Nov., p. 10), was born at Sarasota, Fla., and was graduated from Michigan State University in 1949 with a Bachelor of Science degree in civil engineering. He entered service on the Pennsylvania in April 1949 as a junior engineer, track, serving in Chicago, Cincinnati and Crestline, Ohio, until May 1951 when he was appointed assistant supervisor track at Jamesburg, N. J. In December of that year he was transferred to Wilmington, Del., where he served until January 1954 when he was promoted to supervisor, track, which position he held at the time of his recent promotion.

Your old-fashioned scalping cuts more profits than weeds!

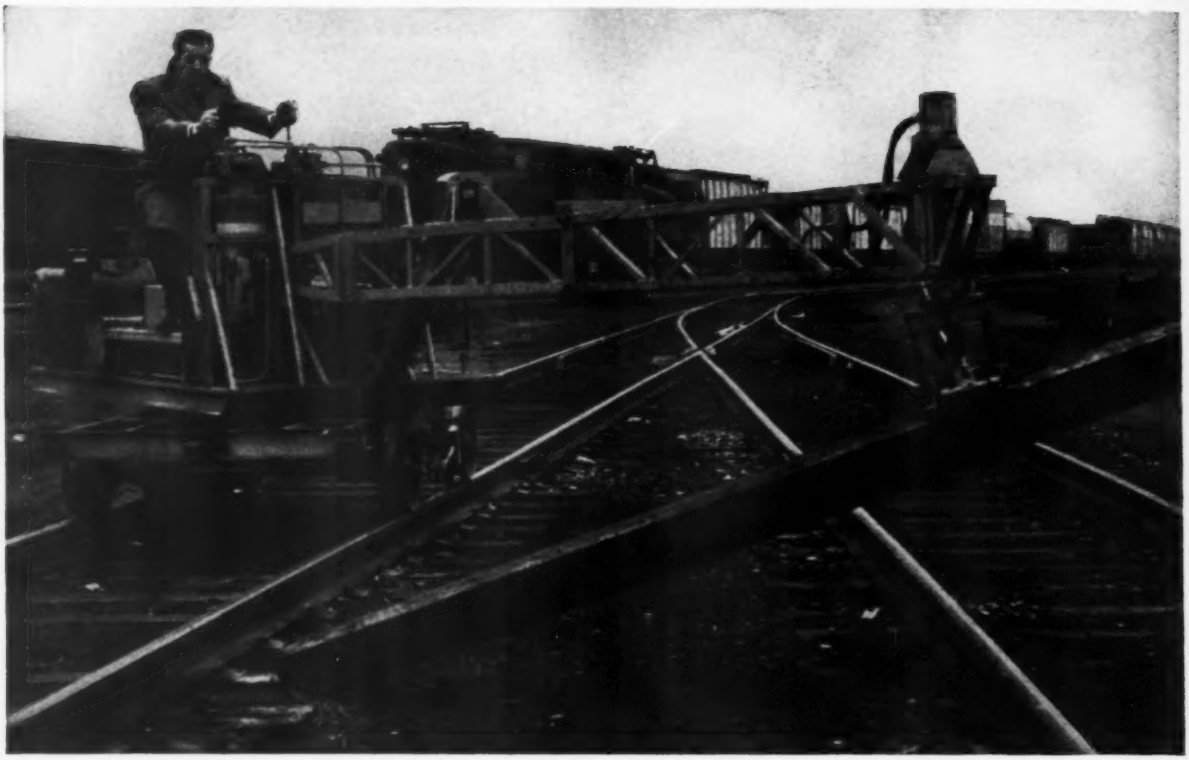
Clearing weeds by shovel-cutting, with today's high cost of labor, is downright extravagant! Borate weed killers can do a much better job of weed control for a small fraction of what hand-scalping is now costing you.

Countless dollars have been saved on weed control by 'roads using our borate weed killers since we first pioneered their development. They are effective against weeds and grasses for long periods... easy to apply... and safe to use wherever vegetation is unwanted. Today we offer a choice of several proven herbicidal formulations—each with special characteristics and advantages—to meet *your* particular requirements.

Start *your* labor-saving weed control program now. Talk to one of our technically-trained salesmen. He will be glad to recommend and demonstrate the right weed killer for you. Write today for literature or to arrange a meeting.

United States Borax & Chemical Corporation
PACIFIC COAST BORAX COMPANY DIVISION
630 SHATTO PLACE • LOS ANGELES 5, CALIFORNIA

Concentrated BORASCU® • UREABOR® • POLYBOR-CHLORATE® • MONOBOR-CHLORATE®



NEW RTW TIE HANDLER PLACES TIES FASTER . . . WITH LESS COST AND EFFORT

With the new RTW Tie Handler, an experienced operator can position as many as 2 to 3 ties per minute . . . approximately 1000 ties in a working day! The RTW Tie Handler simplifies the placing of cross ties, eliminates the labor and danger of manual arrangement, minimizes the cost. You can also use it for piling old ties to be destroyed, or stacking usable ties to be banded and shipped to other locations. It is possible to use the above equipment for setting off light equipment in tie renewal gangs or loading on to push trucks for transporting when working on inside tracks. This machine is equally as effective for handling bridge timbers for maintenance programs.

In keeping with the trend of present developments in modern machines, the RTW Tie Handler is completely hydraulic in operation. Its simple, rugged design keeps maintenance to a minimum, permits additional savings in operational costs. RTW Tie Handlers are designed and engineered by specialists in track maintenance equipment. Write today for complete details.

SPECIFICATIONS FOR 57-BP TIE HANDLER

POWER PLANT: 4 cylinder air cooled gasoline engine—electric starter.
POWER TRANSMISSION: Hydraulic.
TRAVEL SPEED: 7½ to 15 M.P.H.
TRANSMISSION: 2-speed selective type.
ROTATING DECK: 360°.
TONGS: Rotate 260°.
TONG OPENING RANGE: 5" to 16-½".
BOOM: Box type—15' standard length.
BOOM: 5' intermediate section—optional—Extra charge.
BOOM: Travel—60° with boom parallel to track, 30° in either direction, up or down.
TRANSVERSE SET-OFF WHEELS: Optional—Extra charge.
CLEARANCE: Height—72". Width—65".
SWING: 6'2" (measured from center pin).
WHEEL BASE: 60".
OVERALL LENGTH: 10'8".
WEIGHT: Approximately 7000 lbs.

Railway Track-work Co.
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TRACK MAINTENANCE MACHINERY
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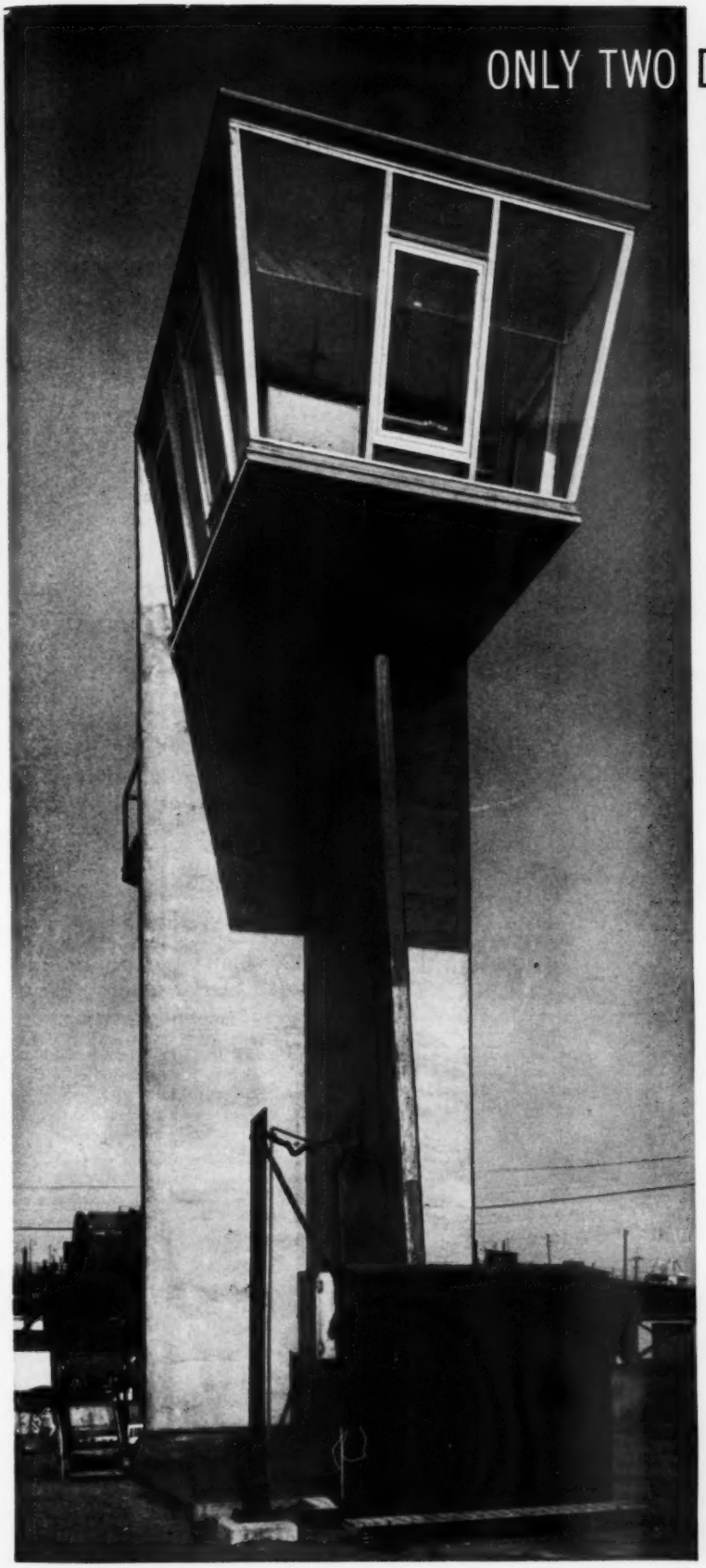


ONLY TWO DAYS TO PUT UP...

C&O'S NEW PRESTRESSED CONCRETE TOWER

Chesapeake and Ohio built this retarder tower with precast, prestressed concrete. A foreman and 4 men with a 25-ton crane put it up without interfering with track operations.

This structure will stay modern looking and last for many years, even under corrosive yard conditions. And except for washing the windows there's practically no maintenance! All conduits for the service leads were cast right in the pylon slabs. This tower is another example of how progressive railroads are using concrete to build for economy . . . for durability . . . for efficient operation.

PORTLAND CEMENT ASSOCIATION

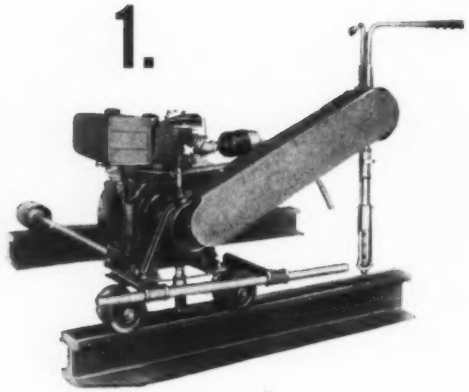
A national organization to improve and extend the uses of concrete

FOR STRUCTURES... MODERN **concrete**

HERE ARE TWO
LIGHT · FAST · ACCURATE
MONEY SAVERS

PROVEN BY YEARS OF HARD CONTINUOUS SERVICE

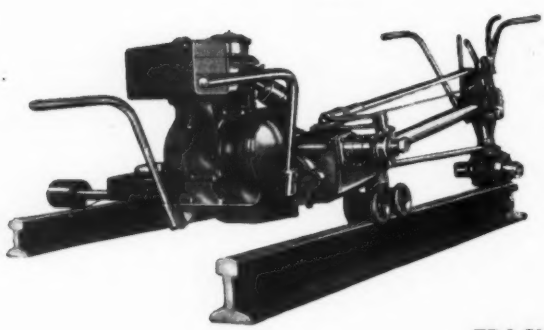
1.



RACO TIE BORER

1. Bores 20-26 holes per min. 2¾" deep.
2. Light—245 lbs.—to push up grade—to locate at hole—to remove from track.
3. Ample motor operates at optimum speed.
4. It has been estimated that when you bore spike holes, you eliminate 75% of regauging—a very worthwhile saving.

2.



RACO POWER TRACK WRENCH

1. Micro Cut-Out, with easily-read graduated scale, assures constant predetermined torque.
2. Power to break any frozen bolt.
3. Rugged but light for easy handling.
4. Fast—efficient.

TRACK WRENCH CHUCK UNIT

For vertical driving of rail clips and screw spikes. Applied to wrench in minutes.

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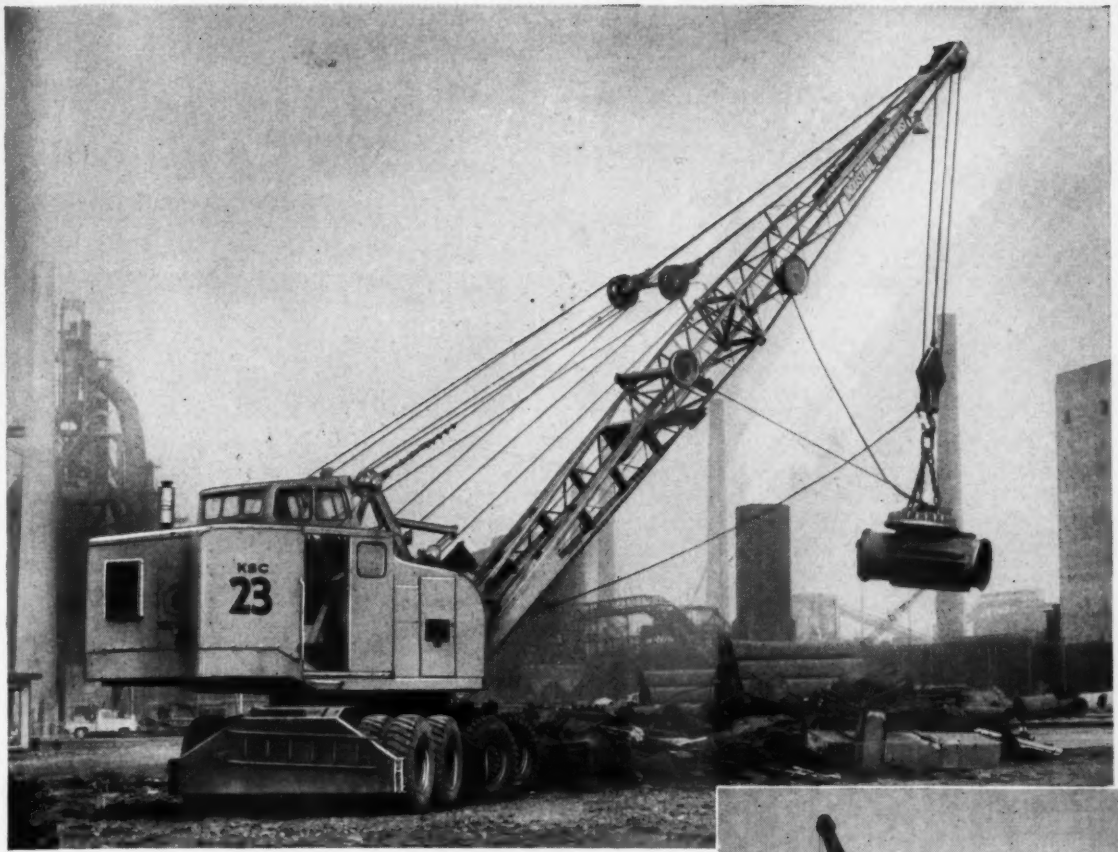

208

ALL PARTS ARE INTERCHANGEABLE on Brownhoist's Diesel Electric Locomotive and Wagon Cranes

The 50 Ton Diesel Electric Wagon Crane and the 50 Ton Diesel Electric Locomotive Crane pictured here are two of several Industrial Brownhoist heavy-duty cranes operated by Kaiser Steel Co. at their huge plant in Fontana, California. Although these cranes operate at peak efficiency on a variety of rugged, daily jobs, it sometimes becomes necessary to replace parts. With Industrial Brownhoist cranes, either locomotive or wagon, part replacement is both swift and economical for every part is *interchangeable* from the car body up. The number of parts in your stock can be cut in half and down time for part replacement can be virtually eliminated.

If you need both a wagon crane and a locomotive crane for the heavy-duty jobs around your plant, get Industrial Brownhoist cranes. You, too, will benefit from the interchangeability of parts and such high performance features as exclusive 360-degree monitor-type cab, clear-vision boom, straight line power train and electric rotation for fast operation. Write for further information today.

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CLAMSHELL BUCKET 250 TON WRECKING CRANE COAL-ORE BRIDGE CAR DUMPER LOCOMOTIVE CRANE

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: Cleveland, Philadelphia, Chicago, San Francisco, Montreal.

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SIMAZINE* 50W

pre-emergence residual herbicide with 7 SAFETY FEATURES

saves railroads time, labor, materials and money

New Geigy Simazine 50W herbicide with the 7 safety features makes possible preventive weed control for railroads—with resultant savings in time, labor, and money.

Simazine 50W herbicide kills both grassy and broadleaf weeds before or shortly after emergence. Its effective residual action gives railroads long-time weed control.

At the rate of 20 lbs. per acre, one pre-emergence application of Simazine 50W controls most annual broadleaf weeds and grasses for an entire season. For longer residual control, or for control of more resistant perennials, use 30 to 40 lbs. per acre.

This year, plan to take care of your weed-control problem early—before growth appears. Remember, Geigy Technical Service is always available to assist you. Write for the name of your nearest distributor. Address Dept. RS-29

CHECK THESE SIMAZINE 50W SAFETY FEATURES

1. **SAFETY TO HUMANS AND ANIMALS.** Extremely low toxicity.
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3. **SAFETY TO SPRAYING EQUIPMENT.** Non-corrosive or abrasive to equipment.
4. **SAFETY NEAR ELECTRICITY.** Relatively low electrical conductivity.
5. **SAFETY FROM DRIFT HAZARD.** Works thru roots—little or no toxicity to foliage.
6. **SAFETY FROM FIRE HAZARD.** Non-flammable.
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RAILWAY
TRACK and STRUCTURES

News notes...

. . . a résumé of current events throughout the railroad world

Railroad freight volume is expected to show a moderate improvement in 1959 over 1958. Car loadings in the first quarter will show an increase of 5.9 per cent over the comparable period of last year, according to estimates of the 13 Regional Shippers Advisory Boards. On the basis of this estimate, freight carloadings of the 32 principal commodity groups will be approximately 5,666,376 in the first quarter of 1959, compared with 5,348,268 in the same period of 1958.

•

Expenditures by the railroads for rolling stock in the first quarter of 1959 will be substantially down from last year, but outlays for property improvements will hold their own. These conclusions are evident from estimates furnished by 105 out of the 110 Class I railroads to the Interstate Commerce Commission. The estimates indicate that gross capital expenditures during the first quarter will be 44.4 per cent below actual expenditures reported by all Class I railroads for the first quarter of 1958. The estimates indicate that expenditures for equipment will be about 59.1 per cent down, but that those for road property will show a decrease of only about 1.1 per cent.

•

Secretary of Labor Mitchell has announced plans for an early meeting of representatives of management and labor in both the railroad and airline industries to get their views as to whether the Railway Labor Act should be amended. Because of strikes among airline employees, Mr. Mitchell feels that "a re-appraisal of the act is in order." However, since the Railway Labor Executives Association has said that it wants no amendments, any such measures are expected to encounter rough going in a "labor-minded" Congress.

•

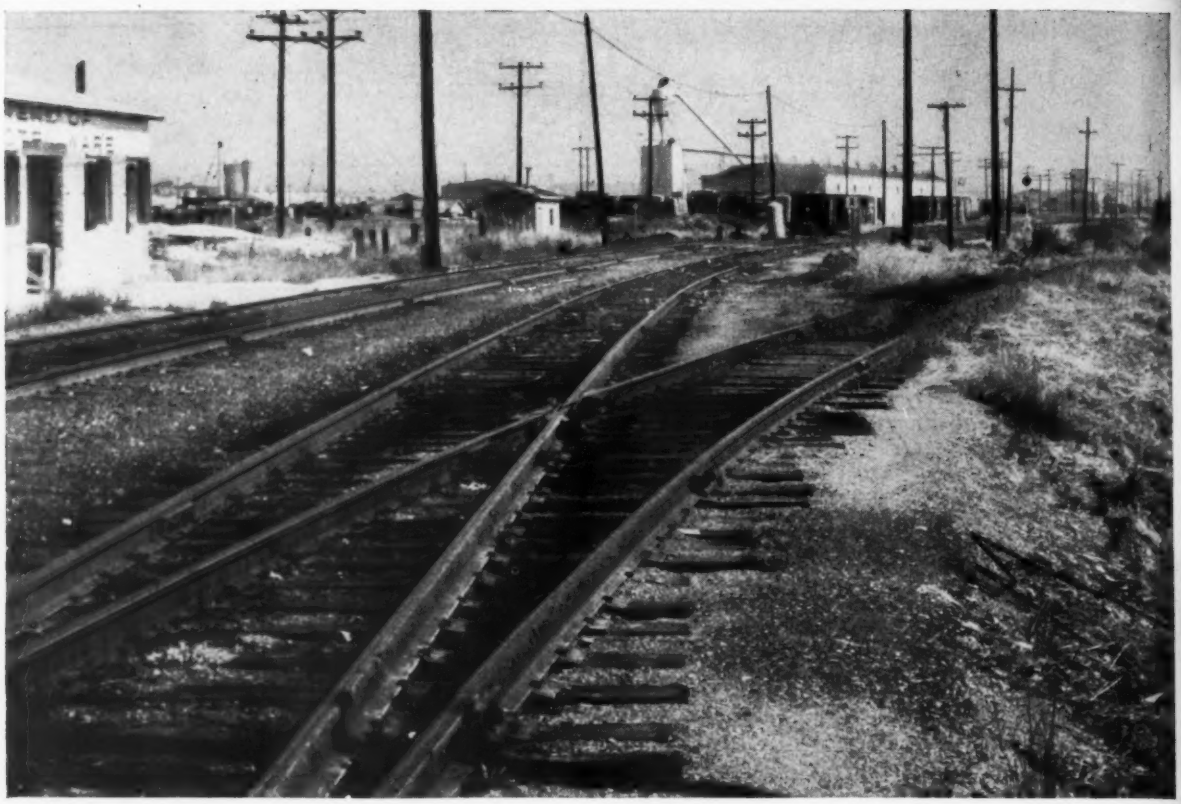
Recent efforts of railroads to retrieve lost passenger business have emphasized reduced fares. Beginning January 25, the Rock Island cut its round-trip, first-class fares an average of 22 per cent. Tickets will carry a 30-day limit. The cuts will be in force for a nine-month trial period. The Burlington and the Katy, while skeptical of the wisdom of the cuts, have reduced their fares on routes directly competitive with the Rock Island. In the East, the New Haven, effective February 1, also cut its first-class, round-trip fares. On a trial basis for nine months, the round-trip fare will be 180 per cent of two first-class one-way fares. Meanwhile, a 15-20 per cent increase in main-line passenger fares went into effect on French railways — part of an effort to make the country's nationalized rail system pay its own way.

•

Free pick-up and delivery service for lcl shipments was discontinued on the Grand Trunk Western on January 1. The road notified shippers it would be unable to continue the service for cost reasons. Similar action was taken some time ago by the Chicago & North Western and the Chicago Great Western.

•

Tonnage hauled by intercity trucks in the third quarter of 1958 was down 2.1 per cent from the corresponding period in 1957, according to the American Trucking Associations. Not since 1954 had the truck tonnage index shown a decline in the third quarter.



• This Southern Pacific Railroad mainline and siding at Santa Clara, Calif., was sprayed with Du Pont "Telvar" in combination with MCP amine/chlorate-borate concentrate in the fall of 1957. In this photograph, taken six months later, the area was still free of weeds. Note the track to the right which was not sprayed.

Sprayed just once —tracks still clear of weeds 6 months later!

DU PONT "Telvar" monuron or "Karmex" diuron weed killers, used separately or in combination with other chemicals or weed oil, provide the base for efficient, economical weed control programs. One application controls weeds for a season or longer . . . saves you handling and storage space . . . cuts annual maintenance costs. "Telvar" and "Karmex" weed killers are wettable powders, and are non-volatile, non-flammable, non-corrosive and low in toxicity to humans and livestock.

The selection of the proper Du Pont weed killer, "Telvar" or "Karmex", depends on various conditions of soil type and moisture. Du Pont Weed Control Specialists are ready to aid you in choosing the proper chemical and in planning an efficient and economical weed control program. Write: E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Room D 4036, Wilmington 98, Delaware.

WHERE BRUSH IS A PROBLEM, use Du Pont "Ammate" Weed and Brush Killer. "Ammate" assures long-term brush control, which means lower maintenance costs. Because "Ammate" is non-volatile, it can be used on rights-of-way, even where they adjoin cropland planted to sensitive crops.

On all chemicals, always follow label instructions and warnings carefully.

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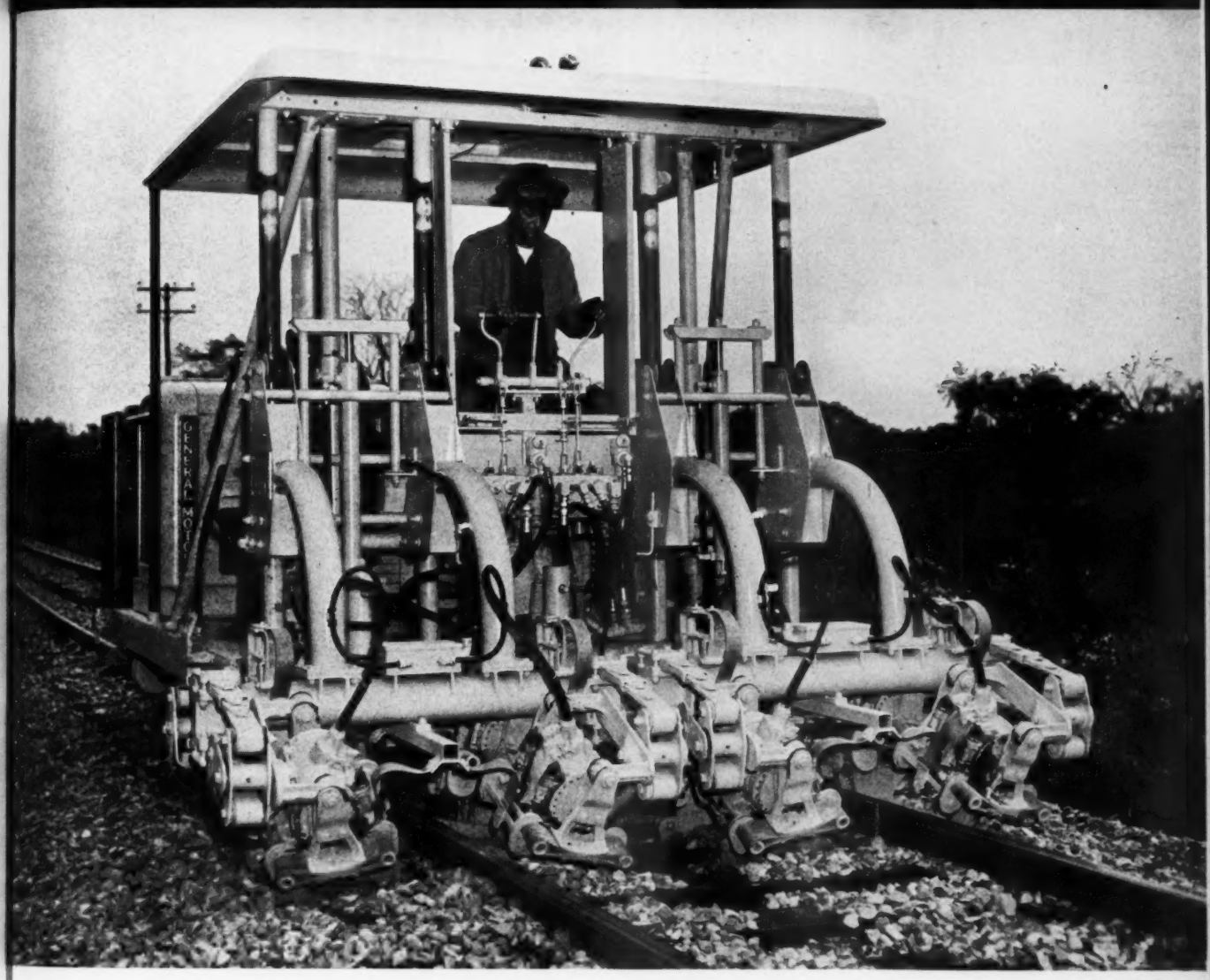
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

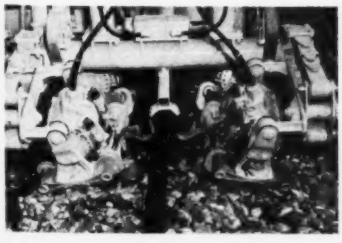
Weed and Brush Killers

KARMEX® diuron weed killer · **TELVAR®** monuron weed killer · **AMMATE®** weed and brush killer

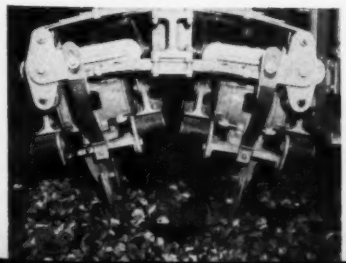
more productive *than ever before*



MORE PRODUCTIVE THAN ANY MACHINE IN ITS CATEGORY



Perfect consolidation of ballast right under the rail and from end of tie to specified distance inside the rail.



Since its inception, THE JACKSON TRACK MAINTAINER has had no close rival in its dual function of quality production tamping and maintaining track of finest characteristics under all conditions. Now, the 1959 model, equipped with much more powerful vibratory tamping motors which deliver FORTY-TWO HUNDRED 6000-lb. BLOWS PER MINUTE to the tamping bars, further increases that wide margin of superiority which led to its adoption by the vast majority of American railway systems. Let us give you the facts which so clearly indicate your best buy, by far, is the JACKSON TRACK MAINTAINER.

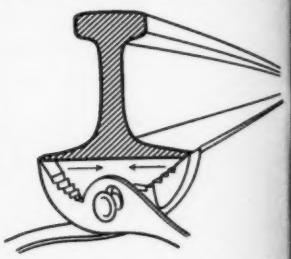
Acquirement plans to suit your needs.

JACKSON VIBRATORS, INC.

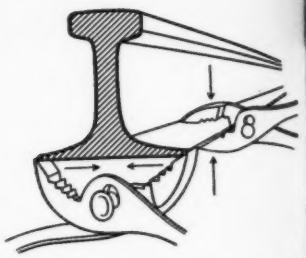
LUDINGTON **MICHIGAN**

Here's how the BULLDOG anchor's two-way grip multiplies holding power

Compare the BULLDOG's holdi power with any other anchor:



Most rail anchors grip the rail base li a single pair of giant pliers—with ho zontal force.



The BULLDOG anchor grips the rail ba like *two* giant pairs of pliers—with bo horizontal and vertical force. Also, becau of the integral design of the BULLDOG two factory-assembled elements, t vertical force of the clamp maintains a sustains the horizontal force of the sprin

Listen to an engineer on stresses:

"Most rail anchors are simple one-piece torsion springs. They have a built-in resistance to distortion which is the force that grips the rail base. This horizontal force is similar to a giant pair of pliers squeezing the rail with constant pressure.

"The True Temper BULLDOG is also in effect a one-piece anchor because it is shipped, handled and applied as one piece. But it is manufactured in two pieces to provide two-way holding power.

"First, a spring is formed from resilient spring steel. It functions as other anchors described above—to grip the rail horizontally. Second—and here is where the BULLDOG is unique—a double-jawed clamp of hardened steel is fitted to the spring to add vertical force which grips the rail at the flange of the base. The over-all effect, to illustrate very simply, is that of two giant pairs of pliers—one gripping horizontally, one vertically.

"But the pliers analogy does not tell the whole story. The two pieces of the BULLDOG anchor, because of their integral design, actually multiply and sustain the gripping power of each other because they provide leverage for each other."

If you'd like to test the BULLDOG on your road, or if you'd like more information on how this amazing anchor can cut your track maintenance costs, contact your True Temper representative or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio. No obligation, of course.

OTHER TRUE TEMPER RAILWAY PRODUCTS: BULLDOG Ballast Forks, Weed Cutters · BULLDOG Shovels · BULLDOG Safety Rail Forks, Hammers, Sledges · BULLDOG Scythes

TRUE TEMPER® BULLDOG RAIL ANCHORS YOU CAN LOOK TO TT FOR LEADERSHIP

Why are there two elements in the BULLDOG anchor?

Listen to this conversation between a track maintenance man and a True Temper engineer.

A. No other construction permits such a tremendous amount of holding power. The two elements actually multiply and sustain the gripping power of each other.

Q. Wouldn't a single clamp, or a single spring, do as well?

A. No. Most rail anchors are simple one-piece torsion springs. They grip the rail base with horizontal force. Only the BULLDOG uses both horizontal and vertical force —a combination that increases holding power 25%.

Q. Well, how do these two elements do that?

A. One element is a spring, tempered for resilience. It functions like ordinary anchors by gripping the rail horizontally. The second element—and here is where the BULLDOG is unique—is a double-jawed clamp of hardened steel. This is fitted to the spring to add vertical force by gripping the rail at the base.

Q. And this actually increases holding power?

A. Absolutely. Precision tests prove it. The BULLDOG's two-way grip, using both horizontal and vertical force, gives you much more holding power. And, after all, holding power is what you're buying in a rail anchor.

Q. Okay. But isn't this anchor harder to apply?

A. Not at all. It's *assembled at the factory* into one unit that's very easy to ship, handle and apply. It has all the convenience of a one-piece anchor. Track workmen like it because one man can install it easily with any striking tool—sledge or spike maul.

Q. Do other railroad men agree with you?

A. They certainly do. Over half the railroads buy the BULLDOG, and the number is increasing. It's the fastest-growing rail anchor in the business.

Want to hear more? Just contact your True Temper representative, or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

OTHER TRUE TEMPER RAILWAY PRODUCTS: Track Shovels • Ballast Forks • Weed Cutters • Hammers • Sledges • Scythes • Safety Rail Forks

TRUE TEMPER. BULLDOG RAIL ANCHORS

YOU CAN LOOK TO TT FOR LEADERSHIP

ANNOUNCING

SOIL STERILANT

The new dry type weed and grass killer for pre-emergence application . . . Now available for your 1959 program!

Soil Sterilant was developed through an extensive research and field testing program, conducted at 16 locations in 12 states.

A complete report on this program is available. Be sure to write for your copy today.

COMPLETE WEED AND BRUSH CONTROL SERVICE

THE R. H. BOGLE COMPANY

ALEXANDRIA, VA. – MEMPHIS, TENN.

RAILWAY TRACK and STRUCTURES

FOREMAN sights raise at low joints and then marks limits to be tamped.

When the Central of Georgia put its heavy track work on a cycle basis and eliminated section gangs it was faced with the problem of keeping its tracks in good riding condition between cycles. It finds that a . . .

. . . Spot tamper does the job

● Where tie renewals and out-of-face surfacing are done on a cycle basis, how can the track be kept in good riding condition economically during the interim?

The Central of Georgia is convinced it has the answer. It uses mechanical spot tampers with built-in jacks. In November 1957 a McWilliams spot tamper was placed in service on this road's Macon division. Since then it has been working almost constantly in the territory between Atlanta, Ga., and Albany, a distance of about 210 miles.

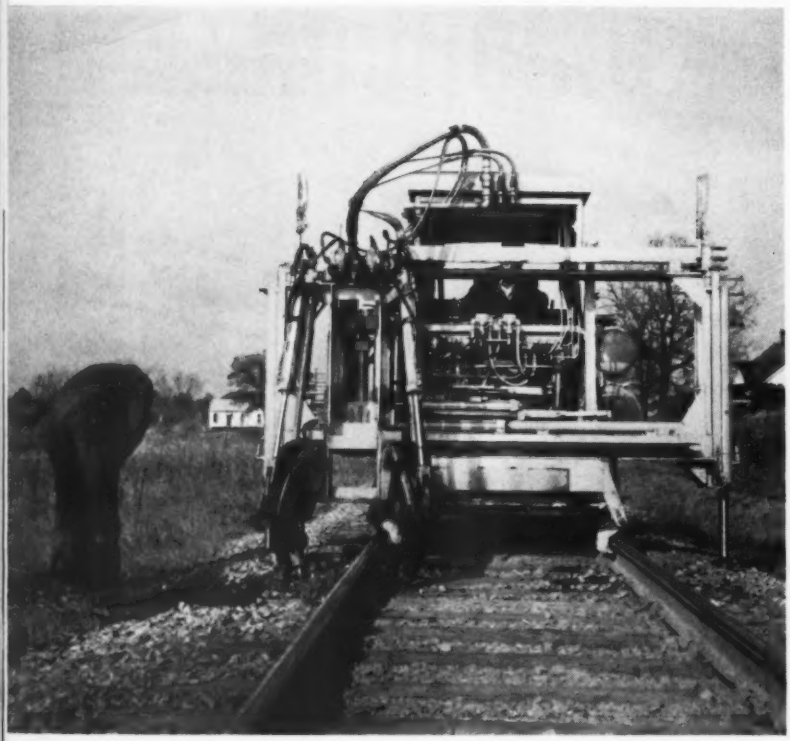
Says George W. Benson, division engineer: "With this machine we'll be able to keep the track in good riding condition until the big timbering and surfacing gang gets to this territory, which will be early in 1959." By way of corroboration of this statement, Mr. Benson cites opinions expressed by train and engine crews to the effect that the riding qualities of the track in this territory have shown definite improvement since the spot tamper went into service.

M/W organization revamped

To get a complete picture of the situation on the Central of Georgia that led to the need for an economical method of spot-tamping track it is necessary to review recent developments in its track-maintenance practices. Several years ago the road completely revamped its over-all M/W set-up with the objective of putting tie-renewal and surfacing work on a cycle basis. To this end three highly mechanized timbering and surfacing gangs were established, one for each of the road's three divisions. Originally a four-year cycle was contemplated but it is likely that the actual cycle will be extended to six years in the future.

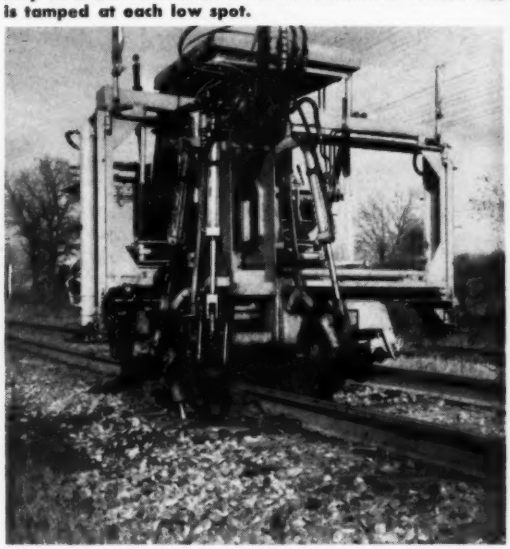
At the time the T&S gangs were established the road abolished its conventional section gangs except at a few special locations such as terminals and on certain branch lines. To carry out the work normally done by section crews the road created what it calls motorized extra gangs. These outfits, which are each equipped with a truck and other necessary power equipment, normally consist of six men plus a foreman. They do all manner of spot work and other tasks that may be assigned to them by the supervisor of track.

In addition the CofGa has what it calls district foremen. These men, each accompanied by one man, patrol the track in their respective districts and also supervise the work of labor-



LOW JOINT has been raised by built-in hydraulic jacks and a tie is being tamped to hold the raise. Note clamps that grip rails when track is to be raised.

SPOT TAMPER, with jacks retracted, tamps ties as necessary on one or both sides of track. A minimum of four ties is tamped at each low spot.



Spot tamper does the job (cont'd)

ers, referred to as yardmen, who are assigned to policing and miscellaneous tasks.

Set-up on Macon division

The Macon division affords an example of the new set-up in operation. This division formerly had many section gangs. It now has only three, one at Atlanta, another at Union Springs, Ala., and the third on a 21-mile heavy-tonnage branch line for a few months during the winter. In place of the former section-gang set-up it has five of the motorized extra gangs and five district foremen, each with three to eight men under his supervision. One of the motorized extra gangs is placed generally on each of the five supervisors' districts on the division, but these gangs may be shifted from one supervisor's territory to another if required by conditions.

When the spot tamper was delivered to the Macon division in the fall of 1957 it was put to work on the Albany and Atlanta districts because, as explained by Mr. Benson, this territory was most in need of spotting work while waiting until the T&S gang could get to it. The machine has been engaged on these two districts practically ever since it was placed in service.

The spot tamper has a regular operator with a system rating, who stays with it at all times. He is assigned a camp car for living quarters, and a tool car. Assignment of the machine is under the general direction of the division engineer and under the direct supervision of the supervisor of track on whose territory it is working at any given time.

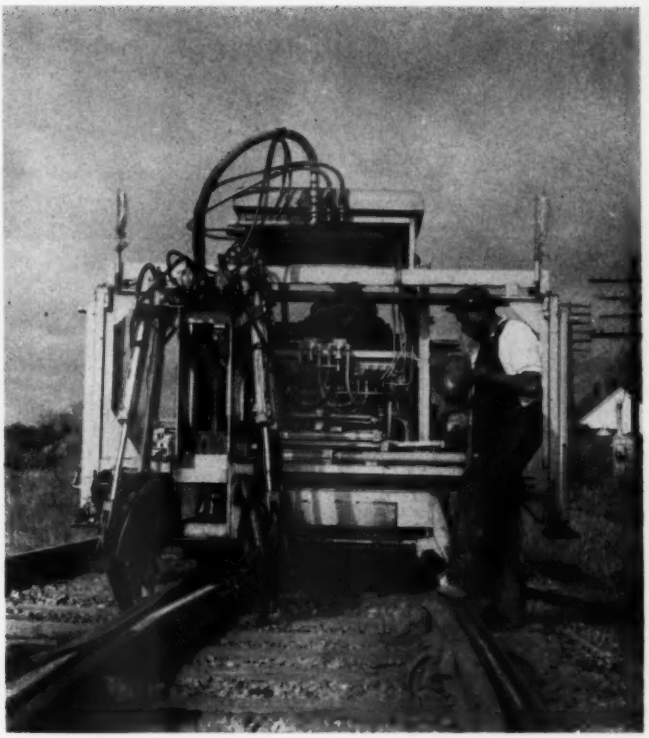
The spot tamper works most of the time in conjunction with one of the motorized extra gangs. In addition to spotting up low joints on main, yard and side tracks it is used for tamping ties under a variety of conditions. When it is necessary to make spot tie renewals the machine tamps the new ties and picks up low joints at the same time. It is used to tamp through highway grade crossings that have been rehabilitated and also through turnouts that have been retimbered. In connection with a program for rehabilitating insulated joints the ties under the joints were formerly tamped by hand but now are tamped by the spot tamper. In some cases the machine may be called on to tamp a limited amount of track out of face. In one such instance it was used to tamp about 1100 ft of track.

When spotting low joints

When recently seen in operation the machine was spotting up low joints. It was working under the supervision of the foreman of one of the motorized extra gangs and was accompanied by two laborers from the same gang. The foreman was sighting the raise for the tamper which, using its built-in jacks, raised the low spot and then tamped the ties within limits marked by the foreman. The length of track tamped at each low spot may run from a minimum of four ties to as much as an entire rail length. One of the two laborers worked with the tamper, forking in ballast as required, while the other was engaged in draining pumping joints, digging out the old ballast and forking it back into place.

In operating the tamper the single tamping head may be moved back and forth across the track as desired. In tamping each tie the operator was making as many insertions of the pneumatically actuated tamping bars as required to bring the tie plate tightly against the base of rail. In this connection it was noted that the

TURNOUT FROG is tamped by the spot tamper. It is also used for tamping through highway grade crossings that have been rehabilitated and for a variety of other jobs.



PUMPING JOINTS are drained by one of two laborers that are assigned to work with the spot tamper. This man digs out old ballast and forks it back into place.

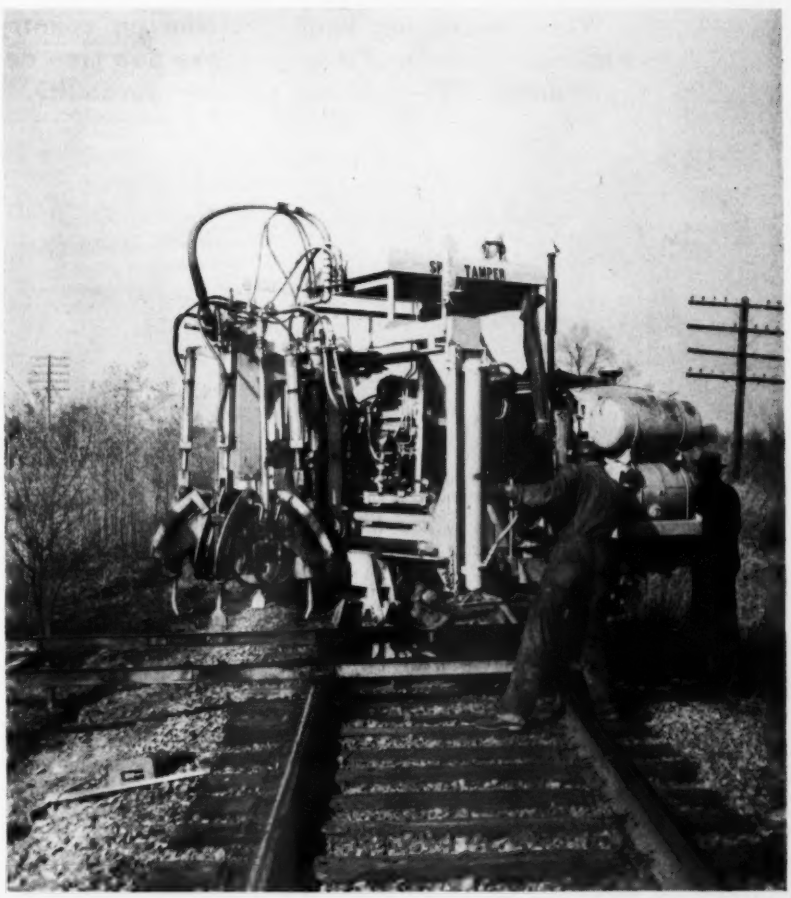
tamping bars inside and outside the rail may be operated independently of each other.

For use when clearing for trains where a siding is not conveniently at hand a set-off of structural steel members is provided for use with the spot tamper. Using a jack incorporated in the machine for this purpose, the unit is raised until its wheels clear the running rails, after which it is turned and lowered on the run-off rails. The operation of removing the tamper from the track in this manner can be performed by the two laborers in about three minutes.

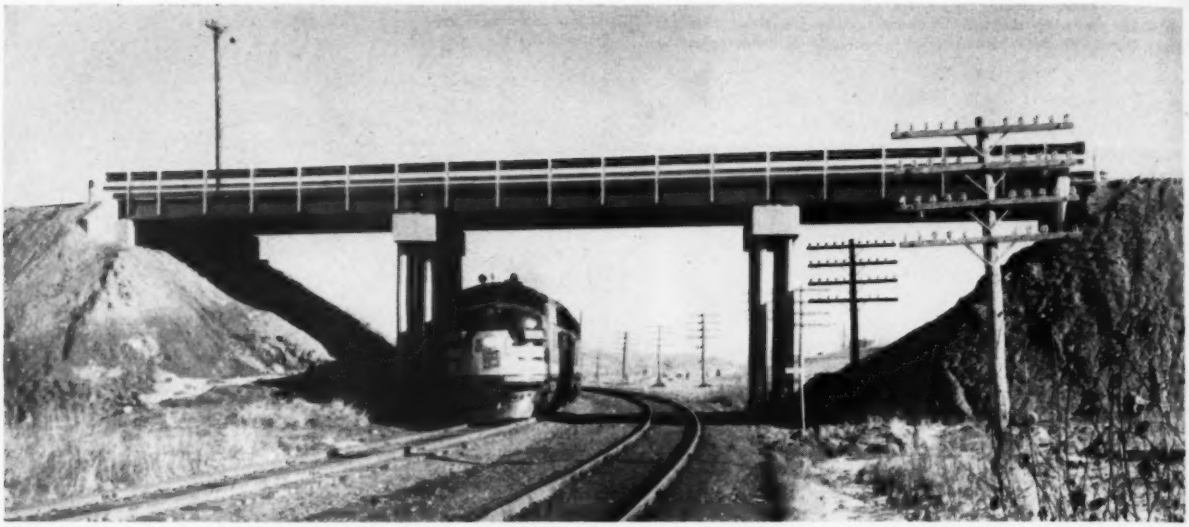
When it is working in CTC territory the machine, which is fully insulated, operates under the "time and limits" system. When working in block-signal territory it operates on a line-up the same as motor cars. To minimize train interruptions the foreman uses a portable telephone to keep in touch with the dispatcher.

Production of the machine when spotting up low joints ranges from 30 to 60 joints per day, depending on the condition of the track and the amount of time lost in clearing for trains.

Says W. E. Chapman, chief engineer of maintenance, in commenting on the road's experience with the tamper: "We couldn't get along without it."



TO SET OFF spot tamper it is raised on a spud, turned and lowered on set-off rails.

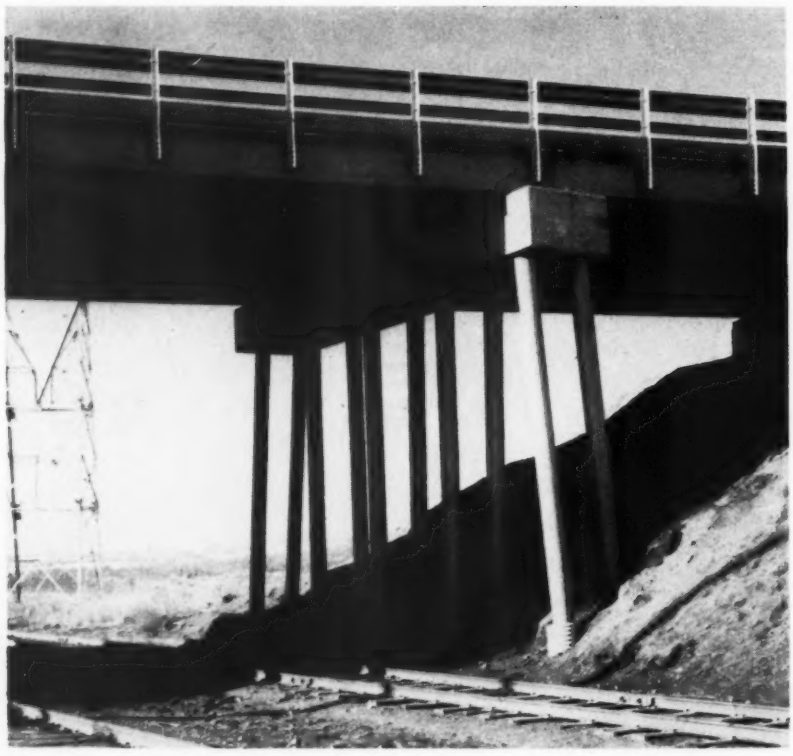


NEW BRIDGE has concrete abutments, steel-pipe bents capped with concrete and wide-flange beams supporting a steel-plank deck.

Old bridge too narrow, too costly . . .

Overpass rebuilt for low upkeep

When increasing traffic volume on country road required a wider and stronger structure, the Soo Line designed a bridge of permanent materials for greater durability.

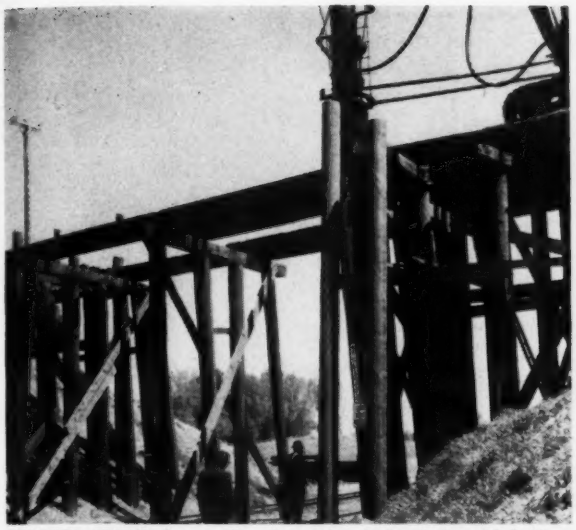


STEEL PIPE PILES in intermediate piers are 40 ft long and were filled with concrete.

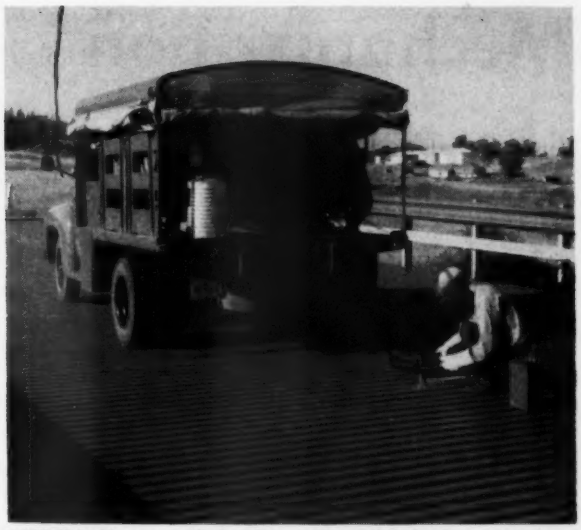
● Many country roads carry approximately the same light volume of vehicular traffic year after year. When crossing railroad tracks, such roads often are carried on timber structures having relatively steep approach spans, four-pile bents and decks 20 ft wide.

Some of these roads, however, are located in areas which grow and become more densely populated. In this event, the vehicular traffic not only increases in volume but also in speed and in weight due to the greater use of trucks. This brings increasing demands from county officials for overhead structures that are stronger, wider and more uniform in grade. So it was with the Silver Lake Road bridge in Ramsey County, Minn., which crosses the Soo Line's double-track line just east of Minneapolis.

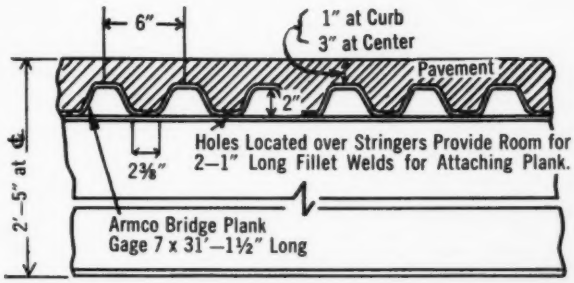
This bridge, built in 1913, was a pile and timber structure having a plank deck. It had become expensive to maintain, many of the piles were posted and it was in need of redriving. In addition, it was narrow and had a maximum weight limit of 10 tons. After consultation with Ramsey



CRAWLER CRANE drove piles from the deck of the old bridge.



DECK PLANK was welded to beams through holes in corrugations.



ABOVE — Section through floor of the new bridge. RIGHT —Roadway is now 30 ft wide and was covered with a hot asphalt paving compacted in layers.

County authorities, the railroad designed a replacement structure as a joint project. The design employs steel and concrete for durability and low maintenance.

The new overhead, designed for H-20 vehicle loading, is 113 ft long and provides a 30-ft roadway at level grade. It has a 39-ft center span flanked on each side by a 32-ft span. The bridge decking is applied over 11 parallel steel (24WF76) stringers on 36½-in centers. These are supported by concrete caps on top of steel piles. The latter are Armco welded steel pipe piles, 12¾ in O.D. and having a .250-in wall.

The abutments are of cast-in-place concrete and are supported by five piles each, driven to a depth of 30 ft. Each of the intermediate piers consists of a reinforced-concrete cap, approximately 6 ft wide, 3 ft deep and 35 ft long, supported by two lines of five piles each, 40 ft long, driven approximately 20 ft below track grade.

The piling was driven from the wood deck of the old bridge by a crawler crane equipped with a Vulcan No. 1 single-acting steam hammer and a 35-ft pendant-type lead braced to the crane. A total of 30 piles was driven. The outside piles on both the abutments and bents were driven on a 1.5-to-12 batter. After driving, reinforcing bars were inserted into the piles to tie into the reinforcing of the caps, and the piles were filled with concrete. Short sleeves, 3 ft long, of 21-in diameter by 12-gage corrugated metal pipe, were applied at the ground line of each pile of the intermediate piers. These were filled with concrete to protect the piling from corrosion.

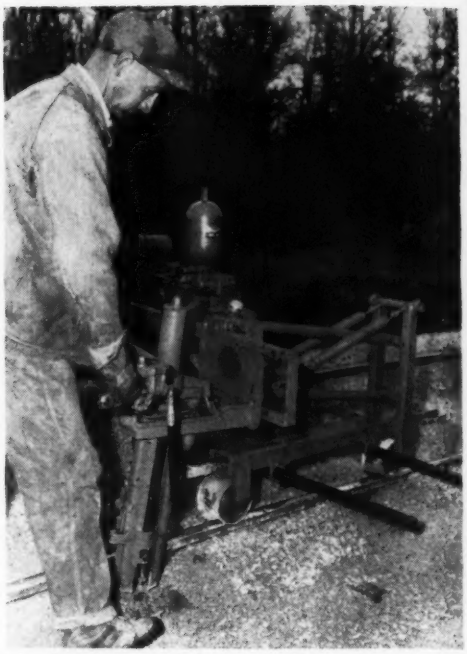
The deck of the new bridge consists of Armco bridge plank supplied in standard 2-ft widths and factory-cut to 31 ft 1½ in long as required for this bridge. The sections are of 7-gage steel with trapezoidal corrugations. Holes were provided in the bridge plank over each stringer and 2-in fillet welds were made in order to fasten the steel deck to the stringers.

For the traffic surface, a hot plant-mix asphalt paving was hauled to the site, spread and compacted in layers. The surface was crowned 2 in at the center, transversely to the bridge length. This paving is the same kind of surface as the roadway on either end.

Armco Flex-Beam guardrail sections at the sides of the bridge were bolted to angle-iron posts spaced on 6-ft 3-in centers. The guardrail, pipe piles, and exposed faces of the outside stringers were painted with a wax-base-aluminum paint. The underside of the steel bridge plank and the interior stringers were painted with a black grease-type paint. Total cost of this bridge was $39,558, or $11.25 per square foot. Ramsey County assumed a portion of this cost and also rebuilt the approaches to meet the new bridge surface.

Mechanization for a short line

The Tennessee Central, like all short lines, was faced with special problems when it decided to mechanize its track-reconditioning work and to place this work on a cycle basis. The machines that were selected, and the manner in which they are used, are described in this article.

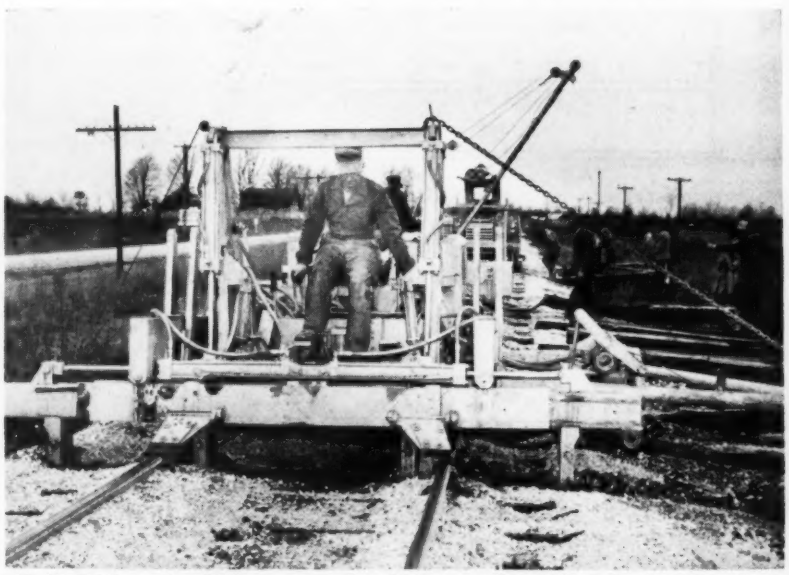


1 Spikes are pulled. New ballast, previously distributed, has been spread by Regulator.

● Short-line railroads, like the larger systems, are faced with the need for reducing costs through mechanization. Like the larger roads, these smaller systems must also provide themselves with machines that they can keep in operation a maximum amount of the time.

Therein, however, lies a special problem for the short lines. Their investment in equipment must be tailored to their relatively limited financial resources.

The Tennessee Central, with 246 miles of main-line track, is one of these smaller railroads. This road wanted to put its track-maintenance activities on a more economical plane by setting up a mechanized crew for doing its heavy tie-renewal and surfacing work on a cycle basis. The problem was solved to its satisfaction by an organization that includes a number of machines capable of performing several operations.



4 Tie Replacer, in addition to removing old ties, scarifies tie beds for insertion of new ties. If necessary this machine can also lift rail to aid removal of old ties.

Specifically, the organization consists of a total of seven machines and 12 men, plus two foremen. With this organization the road expects to "put up" a total of 1½ to 2 miles of track per week. This includes renewing the ties (running at an average rate of about 600 per mile) and raising the track on two inches of new ballast. The plan is to place this work on a three-year cycle.

Of the seven machines used by the gang five are Kershaw units. These are a Ballast Regulator with broom attachment, a Standard Jack-All, a Tie Replacer, a Track Crane with tie inserter attachment and a combination multiple and spot tamper. The other two machines are a Fairmont Spike Puller and a Woolery Spike Driver.

In advance of the tie-renewal work the ties in track are inspected by the track supervisor who indicates those to come out by a yellow keel mark on the rail. All ties are marked to be removed that are judged not to have enough service life to last three more years. Ties to be inserted are unloaded from a local freight train by the section forces. Ballast is then unloaded at the rate of about 15 cars per mile. This is crushed limestone ballast with a maximum size of 1 in, which is obtained locally.

Somewhat in advance of the tie-renewal and surfacing work the ballast

2 Foreman sights for track raise by Jack-All. Super Jack-All, shown here, was later replaced by Standard Jack-All.

3 Old ties are removed by Tie Replacer. Man working with this machine also removes tie plates from the old ties.

5 Track Crane performs two operations. First, it redistributes new ties and gets them in position for insertion. Then . . .

6 . . . Using the tie-inserter attachment, the Track Crane pulls the new ties into position in the track.

is spread uniformly across the track section by the Ballast Regulator and Plow. After the passage of the gang this same machine again goes over the track to shape the ballast to the final section. Using the track broom attachment it also removes excess ballast from the tops of the ties. Because these operations are only a part-time job for the Regulator the operator of that machine also operates the Jack-All in the tie and surfacing gang.

The work of renewing ties and surfacing track is carried out in the following sequence of operations and machines:

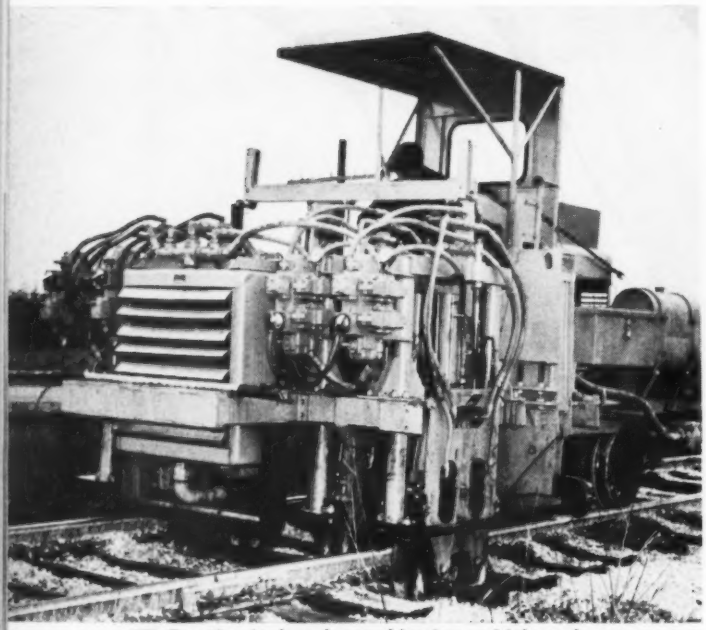
(1) *Pulling spikes* — One man, using the spike puller, removes spikes from the ties to come out.

(2) *Raising the track* — The Jack-All, with one operator, raises the track at every fifth or sixth tie and catches the tie ends in order to hold the raise.

Photo sequence continues ▸▸

Sighting for the raise is done by one of the foreman who uses an instrument mounted on flanged wheels to sight beyond a target mounted on the Jack-All to a spot board, also mounted on flanged wheels, which is maintained a distance of two or three rail lengths ahead of the Jack-All.

(3) *Removing old ties* — A multiple-purpose machine called a Tie Re-



7 Tamping is done by combination multiple and spot tamper. If necessary, two hand jacks are used ahead of tamper.

8 Spikes are driven by pneumatic spike driver. Track is then lined by hand after other work has been stopped for the day.

REGULATOR, in addition to working ahead of gang, follows behind to shape ballast to final section. Since this view was taken it has been equipped with a broom attachment.

Mechanization for a short line (cont'd.)

placer takes out the old ties and scarifies the tie beds. Man-power used with this machine consists of the operator and one man to attach the tongs to the ties and remove the tie plates as each tie is pulled. (In cases where the ties are renewed without raising the track this machine can be used to lift the rail to facilitate removal of the old ties. It will also insert the new ties, but in the Tennessee Central operation this operation is performed by another machine.)

(4) *Inserting new ties* — This is done by another multiple-purpose machine, the Track Crane with tie inserter. Working as a crane this machine first redistributes the ties and gets them into position for insertion. Then, using the tie inserter attachment, it pulls them into position in the track. Personnel consists of the operator and a man to handle the tongs.

(5) *Tamping* — This is done by the combination multiple and spot tamper. If necessary two hand jacks are operated ahead of the tamper to remove any minor deflections that may be present. Men used here consist of the machine operator and a man to handle the jacks.

(6) *Inserting tie plates on new ties* — Two men.

(7) *Driving spikes* — One man sets spikes and another drives them with spike-driving machine.

(8) *Lining* — This is done by hand after the other work has been closed up for the day.

When tie renewals are light

At locations where the tie renewals are relatively light — say about 200 or less — the procedure described above will be varied to the extent that the ties will be inserted ahead of the track-raising operation. However, the same equipment will be used throughout, except that hand jacks will not be needed as the Jack-All will raise the track just ahead of the tamper.

Using the equipment and procedure outlined in this article the Tennessee Central expects to upgrade its tracks while at the same time bringing about a substantial reduction in track-maintenance costs.

Easy way to do it . . .

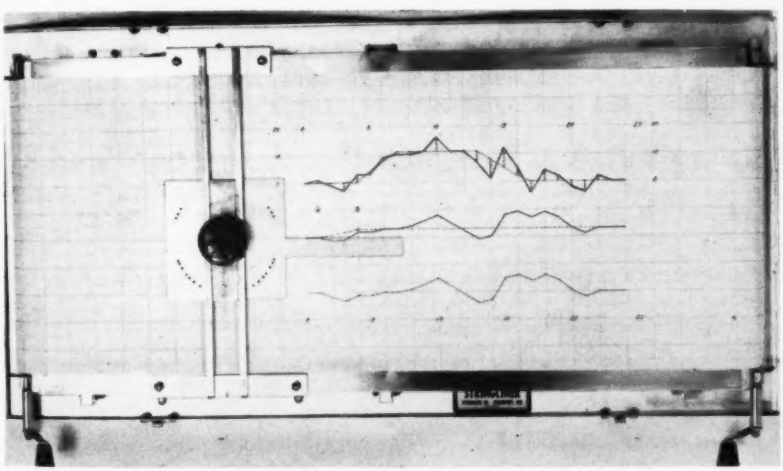
Stringlining curves graphically

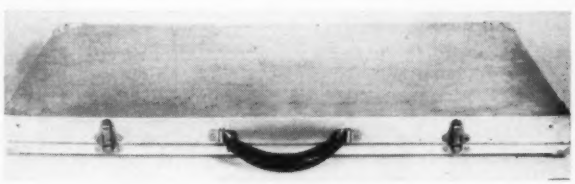
A new, purely graphic system makes use only of straight-line drawings for obtaining track throws required when stringlining curves. Lightweight portable table with special drafting instrument provides a mechanical means for office and field use.

● Several roads are now using a graphic system for determining track throws when stringlining curves. The system involves simple, straight-line drawings, and no computations or combinations of numbers are necessary. The originator of this system is M. B. Allen, division engineer, Nickel Plate, Frankfort, Ind. He has also devised a raised plotting table and dial mechanism, called the "Stringliner," incorporated in a lightweight carrying case (see description below), as a mechanical means for obtaining the desired track throws.

With this system, the measured ordinates are plotted on graph paper. By lowering the "peaks" and raising the "valleys" of the plotted ordinates by compensating one-unit increments, a final smooth curve line is produced. Then, by plotting summations of the differences between the existing and proposed ordinates, a throw line is established. From the plotted throw line, the actual track half-throws are developed.

Although several operations are involved in this system, the work is said to progress very rapidly. It is reported that accurate time studies, made under a variety of conditions in the field and office, show that the graphic system is considerably faster than mathematical computing and equal in speed to any other known method. Each operation of the graphic system is continuous throughout an entire curve and each solution is visual and mechanical. Because of these characteristics, the





STRINGLINER is designed primarily for use in the field, but may be used equally well in the office. It folds into an aluminum carrying case (left) which weighs only 10 lb.

This is the "Stringliner"

The major components of the "Stringliner" are a raised plotting table, cranking rollers on each side for retaining and spreading the graph paper, a dial mechanism and a lightweight carrying case. The latter consists of an aluminum base and cover with a carrying handle. The base contains the raised plotting table which is hinged so that, when the Stringliner is not being used, the dial mechanism and removable cranks for the rollers are stored under it.

The side rollers retain a 10-yd roll of graphing paper to permit continuous "graphing" of up to 700 stations of a curve or curves. The rollers are equipped with friction bearings for keeping the paper tight across the table and in proper alinement under any condition. The paper is moved across the table by turning the cranks.

A transparent plastic dial, on the right side of which is a straight-line rule, is mounted on a frame which is contained by guides and slides for maintaining it in proper register with the graph paper and, at the same time, permit its use at any location on the table. The dial can be turned clockwise or counter-clockwise. It is equipped with precision detents, or stops, which retain it in any of 12 positions "down" and 12 positions "up" from the horizontal. These stops do not prevent the turning of the dial but they lock it in any of the several positions unless the knob, which controls it, is turned.

While the Stringliner is designed primarily for use in the field, it may be used equally well in an office. Made of heavy-gauge aluminum and having no delicate parts, it may be easily and safely shipped to any location for use. It weighs 10 lb and is manufactured and distributed by the Stringline Company, Maish Road, Rte. No. 3, Frankfort, Ind.

Stringlining curves graphically (cont'd)

method is said to be within the province of all supervisory personnel of timbering and surfacing gangs.

How to get started

The first step is to measure the ordinates of a curve, either in sixteenths or tenths of an inch, the same as is done with any other stringlining method, using either 31-ft or 39-ft stations. The latter may be more convenient because the joints may be used, provided the rails on the curve are all full 39-ft lengths.

Here's how the method is applied to a specific example:

Plot the measured ordinates from an assumed base line ("A-A" of Fig. 1), with the plus readings above the base line and the minus readings below it. When successive points are connected by lines, the irregularity of the line is highlighted. After some experience with this method, the lines connecting the plotted ordinates may be omitted.

A visual inspection of the plotted line in Fig. 1 shows light swings in each direction on the tangent track at each end of the curve. It also shows that the spiral at the beginning end of the curve occurs approximately between Sta. 4 and 7 on a line of ordinate readings similar to the dotted line "E-E." It also is apparent that the final curve ordinates, at least between Sta. 7 and 12, may lie approximately on a line at 11 units above the base line on dotted line "F-F." The location of the spiral at the leaving end of the curve is not readily discernible owing to the irregularity of the line. We will leave this spiral for the present to develop the line at the beginning spiral and the curve.

The aim is to lower the "peaks" and raise the "valleys" of the plotted ordinates to develop as regular a curve as is practicable with the allowable track throws. This can be done graphically by placing short (one-unit long) arrowed lines, either up or down, to smooth out the plotted line. To retain the proper balance between what later will produce "in" throws and "out" throws, the arrows must be placed in pairs. That is, every "up" arrow at a "valley" must be balanced by a "down" arrow at a "peak" at the nearest preceding or following station where they can be used to smooth out the original line. The arrows are placed one at a time—either one "up" and then one "down," or one "down" and then one "up." By following this simple procedure, the proper uniform figure develops automatically.

At Sta. 1, it is apparent that the plotted line must be lowered to remove a small "peak." So we will place a "down" arrow (Fig. 2) at this point. It is also apparent that the plotted line at Sta. 2 and 3 are valleys that need smoothing, so we will put a balancing "up" arrow at Sta. 2.

The next step is to place an "up" arrow above the line at Sta. 3 and a "down" arrow below the plotted line at Sta. 4; then another "down" arrow at Sta. 4 and an "up" arrow at Sta. 3; then another "up" arrow at Sta. 3 and a "down" arrow at Sta. 4. We now have made a straight line between Sta. 0 and 4 and all "up" arrows are balanced by a corresponding "down" arrows.

Establishing the spiral

To develop the spiral (line "E-E") we have to place an "up" arrow at Sta. 5 and a "down" arrow at Sta. 6. At

Charts demonstrate, step by step, how final throws are obtained by

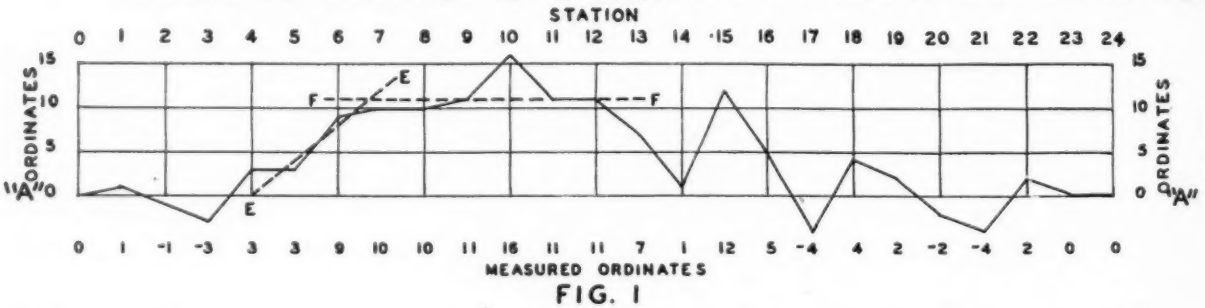


FIG. 1

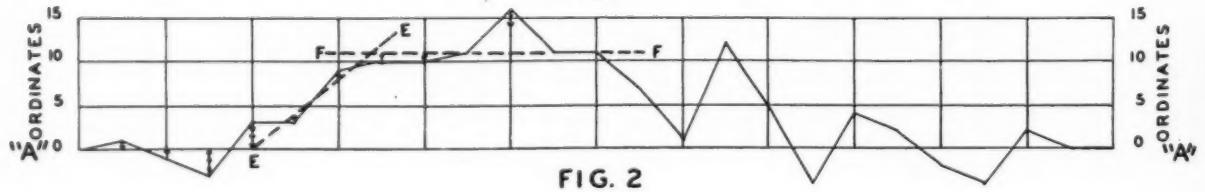


FIG. 2

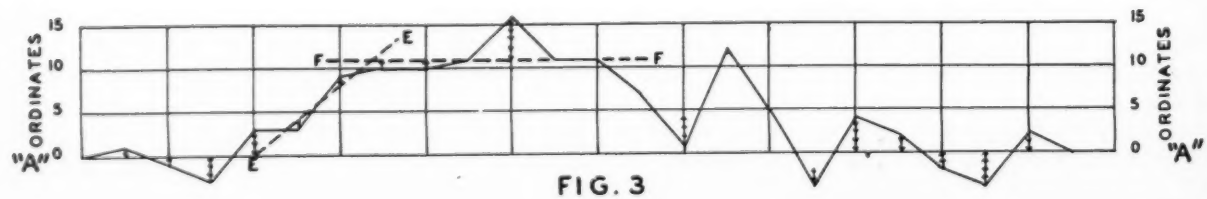


FIG. 3

Sta. 7 we will place an "up" arrow and then balance it with a "down" arrow at Sta. 10, which is a "peak." To produce a true spiral, i.e., in arithmetical progression, we should raise Sta. 7 by one more arrow to the unit 12 line. However, we have already set our curve line "F-F" at unit 11, so instead of raising Sta. 7 one more unit, we will leave it at 11 and see what develops. We now connect Sta. 6 (at 8 units) and Sta. 7 (at 11 units).

Continuing our graph, we place an "up" arrow at Sta. 8 and a "down" arrow at Sta. 10. We now have a graph as shown in Fig. 2. We can see that Sta. 9 needs no further attention as it is exactly on our proposed curve line "F-F." Likewise, Sta. 11 and 12 are on line "F-F" and need no attention. But Sta. 10 is still too high and must be lowered, and Sta. 13 and 14 are in a "valley" and must be raised. To remove the remainder of the "peak" at Sta. 10 we apply three more "down" arrows one at a time at Sta. 10, each one being balanced by an "up" arrow at Sta. 14 (Fig. 3).

We now turn our attention to the leaving end of the curve. It is apparent that there are light swings in the tangent at this end of the curve. To smooth this out, we apply "down" and "up" arrows in couplets and end up with a graph as shown in Fig. 3.

It would appear that the spiral lies on a line approximately sloping from zero units at Sta. 17 to 11 units at Sta. 13. We draw a dotted line "G-G" between these points. Again placing "up" and "down" arrows in couplets, we end up with the graphed curve and spirals as represented by the solid line. This line "G-G" is not as true a spiral as the dotted line between these points. But, the difference is not more than one unit (⅛ in) off at any point, which, for all practical purposes, is completely satisfactory. Our new ordinates are zero at Sta. 4, 11 between Sta. 7 and 13, zero from Sta. 17 and 24, with fairly regular spirals at the ends of the curve.

The lines "E-E" and "F-F" in Figs. 1, 2 and 3 and line "G-G" in Fig. 4 are used in this example only to more clearly illustrate the procedure. Such lines are not necessary and are seldom used once the system is learned. Placing the "up" and "down" arrows in pairs, smoothing out the "peaks" and "valleys" will develop the proper figure for any curve.

The next step is to develop the track throws, in and out, which will produce the curve and spirals represented by our solid line joining the ends of the last applied arrows. This is done through the use of the "Stringliner" by establishing what is termed a "summation" line (Fig. 5). The dial is placed on the table in a horizontal or zero position, starting on an assumed base line "B-B." The summation line is developed by drawing a continuous line and changing the direction of the dial between stations in accordance with the arrows shown in Fig. 4. The change in direction is not made from horizontal, necessarily, but from the last previous slope.

In Fig. 5, we start our summation line at Sta. 0 and, since there is no up or down arrow at this station, draw a horizontal line to Sta. 1. There is a "down" arrow at Sta. 1, so we change the direction of the dial down one position (first detent when dial is moved clockwise) and draw a line from Sta. 1 to Sta. 2.

Next, we have an "up" arrow at Sta. 2, so we turn our dial counter-clockwise one position and draw a line to Sta. 3. This results in a horizontal line, parallel to and one unit below our base line "B-B." At Sta. 3 we have three "up" arrows so we turn our dial counter-clockwise three detents and

(Continued on page 55)

graphic method. (In actual practice only Figs. 4, 5, and 6 are used.)

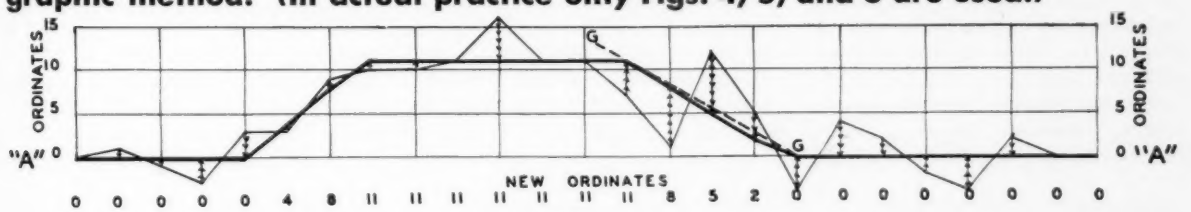


FIG. 4

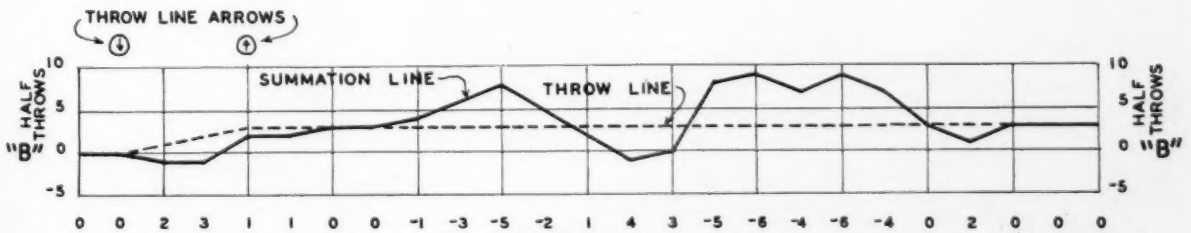


FIG. 5

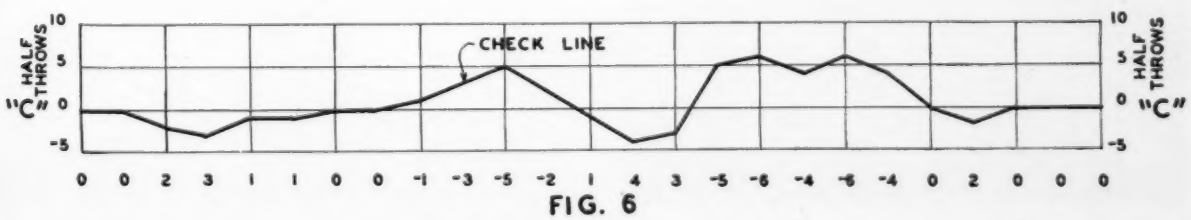


FIG. 6

Cost-saving formula

Make structures

Here's the over-all policy . . .

● "It goes without saying that in the highly competitive railroad business of today, all avenues for controlling maintenance and operating costs must be kept under continual observation and no opportunities passed by." The speaker was Frank R. Woolford, chief engineer of the Western Pacific. He added: "We on the Western Pacific are particularly mindful of this and where an opportunity presents itself we try to follow through."

Mr. Woolford was referring particularly to the WP's program for justifying the existence of structures of all types. "In the history of most railroads," he explains, "many buildings and facilities have been perpetuated over the years and in many cases a close analysis will reveal that many facilities can either be entirely eliminated or considerably reduced. Few actually require the space provided and seldom, if ever, (unless consolidations are involved) is it necessary to provide for an increase. If the structures are found necessary, then conversion or adaptation to the proper size required for the minimum of maintenance is in order."

"On the Western Pacific," he continued, "dieselization has presented many opportunities for the actual pursuit of this study concept. Large terminals and repair facilities, together with water facilities, and other attendant equipment, are no longer required. Thus, large and extensive terminal facilities have been entirely eliminated or at least concentrated into a relatively few simple buildings of a permanent type, such as metal or concrete, resulting in a very economical maintenance arrangement."

Eliminate or modernize

Mechanization of maintenance-of-way work has had a similar effect on the facilities formerly provided for the section forces, explains Mr. Woolford. "Many of these facilities have been made surplus and the majority have been eliminated, while the remainder has been considerably reduced. Those that are left have been considered for possible modernization to a more permanent type, utilizing permanent materials such as asbestos for covering roofs and wall exteriors.

. . . and here's how it works

The WP's combination office and station building at Elko, Nev., and other buildings at that point, came under scrutiny in connection with the program to reduce maintenance expenditures.

The old building here was an outmoded, two-story, frame structure that was erected in 1909 to serve both as a passenger depot and a division office building. Over the years it had been remodeled many times, including the addition of leantos and new rooms and alterations to the interior.

"The results," said Mr. Woolford, "were that we had a large two-story structure in constant need of maintenance and quite unfunctional, with unsuitable heating, air conditioning and lighting—all resulting in unjustified operating costs."

Following a careful study of the situation at Elko several decisions were made. One was that the division headquarters should remain at Elko. Another was that functions served by several other buildings could be incorporated in the depot building. A third was to convert the depot into a more attractive structure by remov-

← BEFORE

Built in 1909 the old depot and division office building at Elko was a frame structure that had been remodeled many times.

AFTER →

With the second story removed and the remainder modernized the building is not only attractive but will cost much less to maintain.

justify their existence

It costs money to maintain railroad structures — any kind of structures. Nowhere is this fact given greater emphasis than on the Western Pacific. On this road every structure, whether its a bridge, a building or a tunnel, is being scrutinized in a continuing program to find ways of reducing maintenance costs. The result is that an estimated 800 to 1000 structures have been entirely eliminated, and many more are currently under scrutiny. Sometimes, as brought out in this article, the result is better appearance as well as economy.

When new buildings are planned we give consideration to prefabricated metals or concrete in order to realize savings in maintenance costs."

This policy is not confined to buildings. Bridges, tunnels and other roadway facilities are given the same kind of scrutiny "when there is a question of their renewal or when maintenance reaches a point where replacement seems to be justified."

"Our bridges," explains Mr. Woolford, "are examined to determine if they can be eliminated entirely, reduced in size, or reconstructed of a more durable material. Where elimination or reduction is not practicable, the structures are then studied for conversion to a more permanent type, such as pipes, reinforced or prestressed concrete, steel, or fully treated wood, thus reducing or eliminating, as far as possible, our maintenance problem. This also applies to tunnels. Our track alinements are studied quite carefully to determine whether it is possible to eliminate a tunnel by either daylighting or by line change. Where such is not practicable, a program of either concrete lining or shotcreting is carried out."

As a result of this program Mr. Woolford estimates the WP has eliminated a total of 800 to 1000 buildings and other structures. An additional 400 to 500 structures are currently under study to determine if they can be eliminated or replaced with more permanent structures. "Those that are destined to be retained will be carefully studied to determine whether they are positively needed in our modern operation, or if a considerable reduction in size can be effected."

ing the second story and doing other remodeling work. The latter included enlargement of the concrete basement and the construction of an addition to the rear of the building, resulting in a structure that is 54 ft wide and 164 ft long.

The reconstruction work involved the remodeling of the first floor to satisfy the requirements of all those who were to occupy the building. Automatic heating, air conditioning, fluorescent lighting and other refinements were incorporated. "Our main objective," said Mr. Woolford, "was to hold future maintenance to a minimum, and this was evidenced by the selection of permanent materials such as brick exterior, concrete floors, metal windows, etc."

What the WP now has at Elko, says Mr. Woolford, is a "most attractive, economical and functional structure for the dual purpose of serving as a division superintendent's office and joint passenger station (Southern Pacific-Western Pacific)." Not only was it possible to remove the second story of the structure but also several buildings adjacent to the depot that had been used for the storage of records and files.

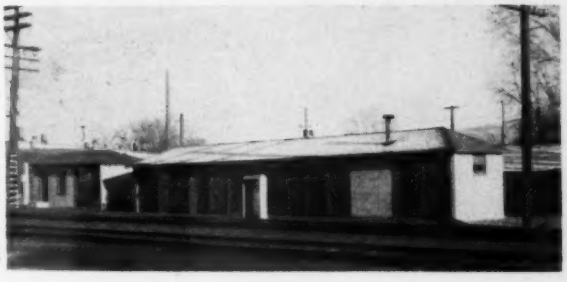
The remodeled building, adds Mr. Woolford, has proved "very functional . . . and apparently it has satisfied those who are using it."

BEFORE →

Across the tracks from the depot at Elko was this unsightly cluster of buildings for housing motor cars, storing records, etc.

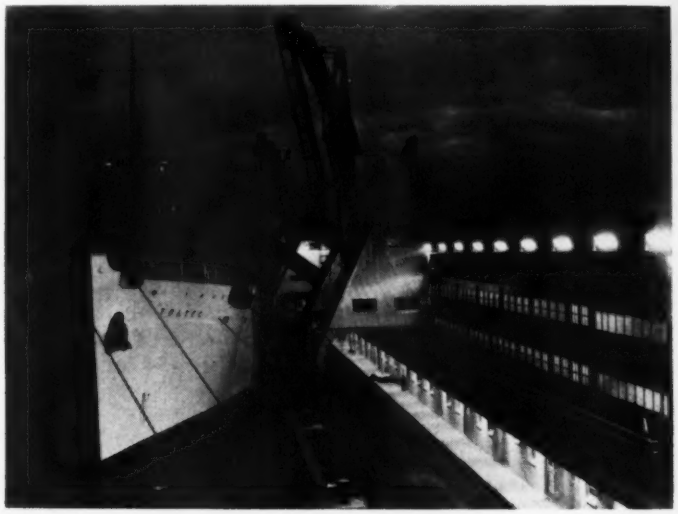
AFTER →

The five structures have now been replaced by two buildings covered with asbestos siding. Result: Improved appearance and lower upkeep.

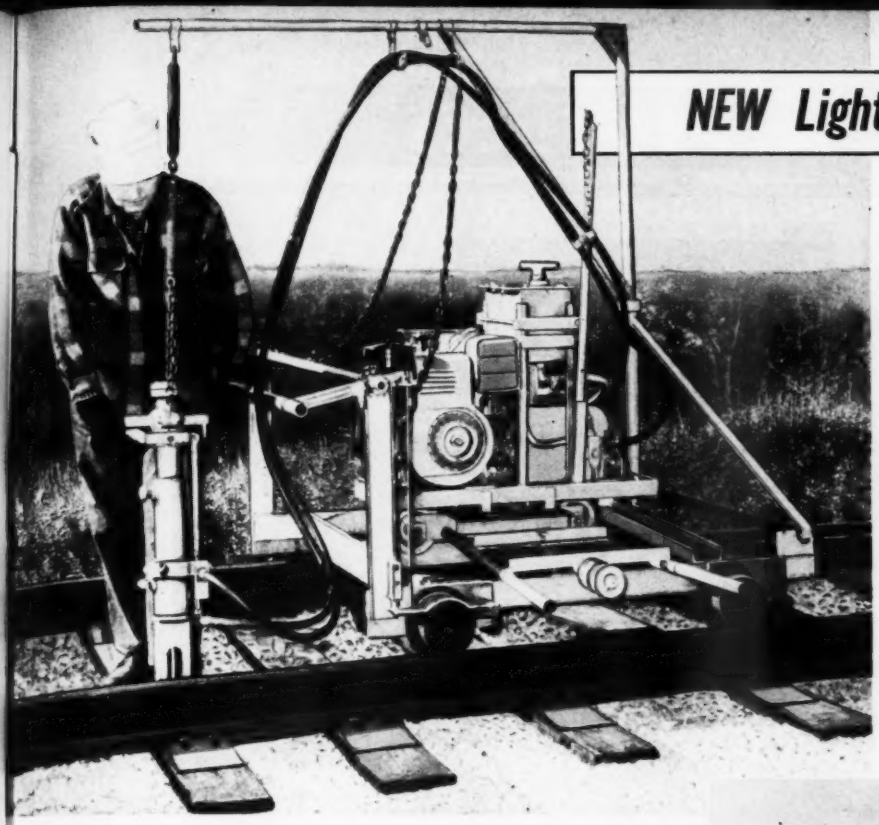


THE L&N's new Boyles Automatic Classification Yard at Birmingham, Ala., is 4.8 miles long and covers 250 acres. Containing 95 miles of tracks it has a peak 24-hr load of 4200 cars. Classification procedure is guided automatically by a coded pre-punched tape, retarder is controlled by an electronic computer. Communication system includes two-way radio and closed-circuit television.

News briefs in pictures . . .



ONE OF FOUR shipside gantry cranes (right) reach into a ship to unload its cargo of bananas at the B&O's new Locust Point Fruit Terminal at Baltimore, Md. Boom (lower left) contains a belt conveyor with sling pockets for carrying stems into the building. There they are transferred onto the 5800-ft curveyor system (lower right) for movement to railroad cars or trucks.



NEW Lightweight Carriage

speeds operation of NORDBERG Hydraulic SPIKE PULLER

Ready for spike pulling operations, the Nordberg Hydraulic Spike Puller and Carriage is compact, easy to operate. Note arm and chain support for the gun, and the push bar which also acts as a brake release.

• Adding to the versatility of the Nordberg Hydraulic Spike Puller, a new lightweight, aluminum frame carriage has been developed to further improve spike pulling operations on tie renewal jobs. Featuring high speed pulling and less operator fatigue, this new unit may be used with any new or existing Nordberg Hydraulic Spike Puller.

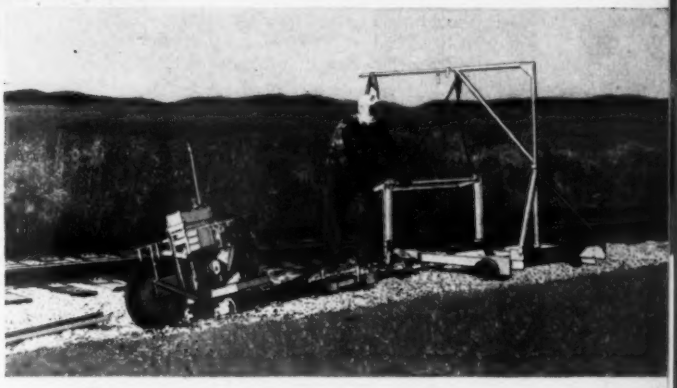
Actual tests show that the new carriage greatly increases high production spike removal. In one such test, 360 spikes, 4 spikes to a tie, were easily pulled by one man in 30 minutes . . . *that's 720 spikes per hour, or one every five seconds.*

In pulling spikes, the operator swings the pulling gun into position, fits the claw over the spike head, presses the trigger, and pulls the spike . . . which is automatically ejected as the claw returns to pulling position.

This versatile Nordberg Hydraulic Spike Puller and Carriage is a time and money-saving investment on many jobs. It can be used with equal effectiveness in yards, terminals, on bridges, and on all-around rail renewal work.

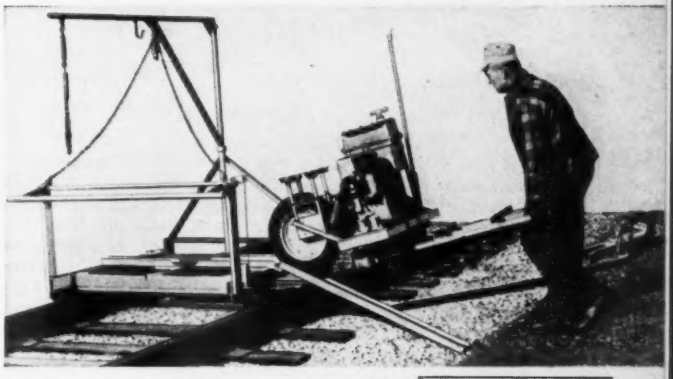
Write for complete information.

NORDBERG MFG. CO.
Milwaukee 1, Wisconsin



Preparing for spike pulling operations, the operator easily lifts the aluminum-framed Spike Puller Carriage onto the track.

With the Carriage on the track, the Spike Puller is easily rolled up the aluminum set-off ramp into position on the Carriage.



NORDBERG *Mechanical Muscles*®

Write for LEASING Plans

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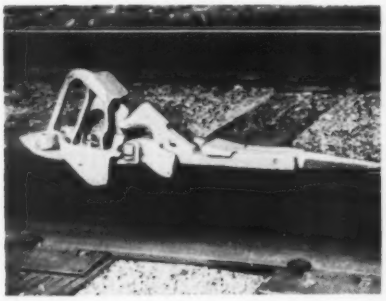
R259

Products



Improved car stopping with . . .

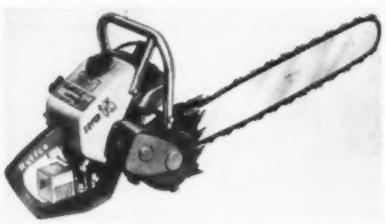
Track skate

DESIGNED to improve the stopping and handling of cars within retarder yards the new Cox Safety Skate has features which permit it to "skid through" frogs without causing derailments, it is claimed. Individual spring-loaded lugs clamp the skate to the rail and guide its movement. The lugs are designed to snap free of obstructions encountered along the rails at frogs or open switch points. To keep car wheels from backing off when they hit the skate, a positive pivot on the tongue of the skate lifts the tongue as the car wheel rolls upon the skate. The device weighs 27 lbs and is said to be interchangeable on either rail. It is painted with a reflective coating for easy identification. The manufacturer states that the new skate protects against derailments, reduces car-stopping distances, provides increased service life and positions onto, and is removed from, the rail in a minimum length of time. *W. T. Cox Company, Dept. RTS, 6308 Troost Avenue, Kansas City 10, Mo.*

Water repellent for . . .

Masonry treatment

A NEW WATER repellent is available that is claimed to be as effective on mortar as it is on brick, concrete or other masonry. Designated Dow Corning 770 Water Repellent, the manufacturer states that it is clear as water and can be diluted with plain mineral spirits. The new product is also stated to be dilutible in common solvents and that its color is less than 120 on the APHA scale (ASTM D1209-54) at 33 per cent solids (as it is shipped). Also that at 10 per cent solids its color is less than 50. The service life of masonry treatments based on Dow Corning Silicones has, the manufacturer states, been demonstrated in tests to give water resistance usually lasting over five years. *Dow Corning Corporation, Dept. RTS, Midland, Mich.*



Triple Cutting action with . . .

Chain saw

A VARIABLE-SPEED transmission makes the new 1959 Hoffco Super 645 gear-driven chain saw a universal, job-rated saw that is applicable to the widest variety of work, it is claimed. The manufacturer states that this is accomplished by means of triple cutting action which provides a chain speed for every cutting need. The transmission is said to allow the Super 645 to be quickly converted from a 20-in high-speed chain into a two-man saw using a 50-in bar and helper handle. The saw can be completely disassembled without the use of special tools or factory-trained mechanics, it is claimed. The Super 645 is stated to have been designed with its weight distributed so as to attain a centerline, in-balance weight factor which works with the operator when making the cut. It is available with 14-in to 50-in bar and chain, 15 to 18-in bow bar, and a West Coast wrap-around handle and spike. *Hoffco, Inc., Dept. RTS, Richmond, Ind.*

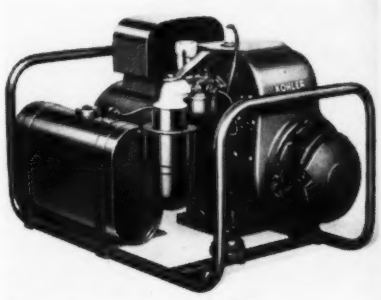
Two-stage action for . . .

Air cleaner

CATERPILLAR D9 tractors now have, as standard equipment, a new air cleaner that is claimed to remove 99.8 per cent of all dirt from the diesel's intake air. The manufacturer states that the dry-type unit is fully effective at any engine speed and is designed for speedy servicing. It features a multi-cyclone pre-cleaner and disposable resin-impregnated cellulose filter. The two-stage action first removes the heavier particles by centrifugal force in the pre-cleaner. The finer particles are then trapped by the disposable filter element. Dirt particles are collected in a cup located at the bottom of the unit.

Machine availability is increased, it is claimed, since the time required to service the unit is reduced by 75 per cent. This is accomplished by removing the cup and emptying out the accumulated dirt. It is also claimed that the cellulose filter element can be easily cleaned and reused and that the cost of replacement elements is considerably less than the cumulative cost of oil and man-hours necessary to maintain the oil-bath types.

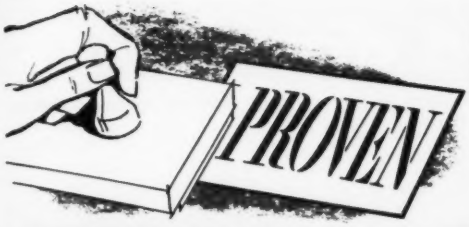
The new unit is said to eliminate the danger of engine damage resulting from infrequent servicing by causing the engine to lose power and smoke when the filter element becomes plugged with dirt. This visual warning serves to remind the operator that the cleaner must be serviced. The DW20 and DW21 tractors are also equipped with the new air cleaner. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*



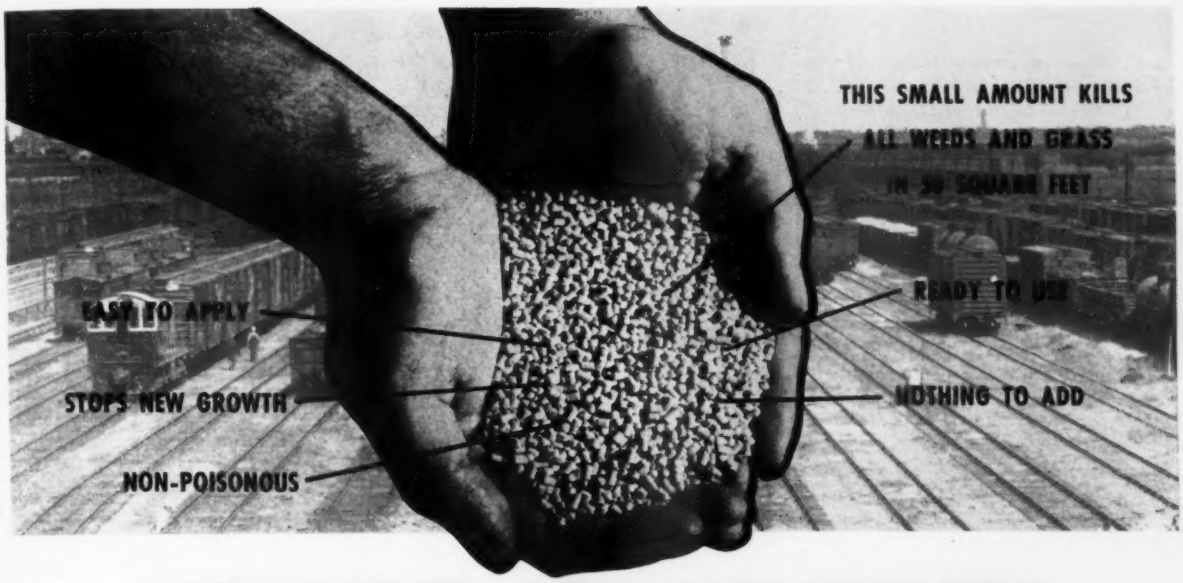
Versatility claimed for . . .

Electric plants

TWO NEW high-frequency electric plants are available for use with portable electric tools. The Model 2.5MV55 plant is a 2500-watt, 180-cycle, 3-phase, 230-volt ac and 115-volt dc unit whereas the Model 2.5-MV35 plant is a 2500-watt, 180-cycle, 3-phase, 115-volt ac and 115-volt dc unit. The manufacturer states that this combination of power characteristics can accommodate all of the portable electric tools commonly used at construction sites. It is claimed that vibrators, pavement breakers and electric saws which require 230-volt, 180-cycle, 3-phase ac can be operated simultaneously with standard portable electric tools and floodlighting equipment operated on 115-volt dc. It is also stated that small concrete vibrators and high-cycle portable electric tools can be operated by the 115-volt, 3-phase ac and 115-volt dc model. Both models have as standard equipment a recoil starter, two-gal fuel tank, mechanical fuel pump with fuel filter and shut-off valve, oil bath cleaners, two twist-lock ac four-prong receptacles and one "twist-tite" dc two-prong receptacle. *Kohler Company, Dept. RTS, Kohler, Wis.*



WEED & GRASS KILLER



CHLOREA® GRANULAR

CHLOREA GRANULAR is a pelletized weed and grass killer. The pellets are ready for use . . . no mixing or adding of water is required. Application is easy to make with simple equipment, or by hand. These important advantages combined with powerful "kill all" effectiveness have been fully demonstrated by extensive use on many leading railroads.

Here are the important facts about Chlorea Granular:

1 Kills ALL weeds and grasses . . . stops new growth for a year or more.

2 Particularly intended for use where large scale spray application is impractical . . . such as freight yards, terminals, storage yards, under bridges and trestles, around warehouses, stations and other similar places.

3 Easy to use . . . apply with any mechanical type of granular material spreader; or broadcast by hand.

4 Low application rate . . . about 400 pounds to the acre . . . less where only annual vegetation is involved.

5 Contains 3 proven chemicals . . . this combination kills deep rooted weeds and grasses, as well as shallow rooted grasses, weeds and annual seedling growth.

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RAILROAD DIVISION HEADQUARTERS

Dept. 6 A, 608 South Dearborn St., Chicago 5, Illinois

What's the answer?

To be answered in May

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: February 27

1. Should switch points that have been repaired by welding be used in main track? If so, can welded carbon-steel points be used, or should this be confined to manganese-steel tips only? Why?

2. What method is the most economical for renewing the middle stringer of a three-timber chord of a pile trestle? Explain in detail and cite the advantages over other commonly used methods.

3. When a car is set out because of a hot box, what measures should be taken to prevent the spread of the fire to the car and lading? Are the track forces responsible in any way? Explain in detail.

4. What safety precaution should be taken when transporting men in trucks? When transporting tools and equipment? Explain.

5. Usually, the railroad designer of a building never inspects the structure after it is once placed in operation. Is this good practice? What procedure should be followed to acquaint the designer with the soundness of his design as well as of the performance of any new materials used? Explain.

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Relaying both rails simultaneously

When relaying rail out of face is it practicable to lay both sides simultaneously retaining the staggered-joint pattern, instead of one side one day and the other side the next day? What are the advantages and disadvantages?

Lay one rail ahead

By A. L. Covey
Supervisor Track
Wabash
Chillicothe, Mo.

In my opinion, when relaying rail out of face, it is more practicable to relay rail on one side each day, or maybe for two or three days on one side at a time. This will give the rail that is laid a chance to get seated on the tie plates and ties. This produces a better top on the rail and makes it better for gaging the other rail. This will save several man-hours, and will result in more rail laid per man.

When relaying rail on both sides simultaneously, and retaining the staggered joint pattern, not as many rails can be laid per day and there will be a loss of several man-hours each day. One advantage of laying rail on both sides each day is that a surfacing gang can follow closely behind and keep the new rail surfaced up, thus insuring the same bearing on all ties.

Work two gang units

By L. G. Lawson
Roadmaster
Canadian National
Melville, Sask., Can.

While not impossible it is impracticable to lay both sides at one time or simultaneously when relaying rail out of face. To mention a few of the steps necessary when relaying, the spaces between ties have to be cribbed, the ties adzed, creosote applied, spikes pulled and redriven, bolts taken out and replaced, and holes drilled for gager plugs. Nearly all the conventional machines now used to perform this work are run on one rail and sometimes both rails. If both rails were to be relaid at the same time or simultaneously, new type machines would have to be used entirely.

In relaying rail the newly laid rail is gaged to the rail still in the track. With the use of new gaging machines and hardwood plugs, the track that is in fairly good line is usually in almost perfect line and gage when the new rail is laid. To do this without the aid of the one rail still in service would be quite a challenge to maintenance forces.

On our railroad we have laid rail almost simultaneously with two complete gangs working within one-half mile of each other and in conjunction with one another. This works very well and has many advantages over laying only one rail the one day and doing the remaining rail the following day. All the advantages of laying one rail at a time are maintained by this method and the disadvantages of having to move machinery back are avoided.

Rail is relaid in half the time by this method, thereby minimizing traffic delays. One set of flagmen handles the job. One man handles the dispatcher's phone for both gangs for keeping delays to trains at a minimum. Stand-by units are cut in half. This is especially true where only one machine is used, such as the rail layer, cribber or combination cribber, creosote applicator and adzer. Another big advantage is the fact that these machines always move ahead and do not have to be taken back to work on the second rail, which is always a slow and expensive job.

By relaying rail with two gangs working closely together, or one large gang split in two with each unit being a complete relay gang, supervision by a railway officer also is cut in half. Stand-by machinery is cut in half and the job is completed in half the time. When laying a heavier rail than that

Armco Steel Buildings

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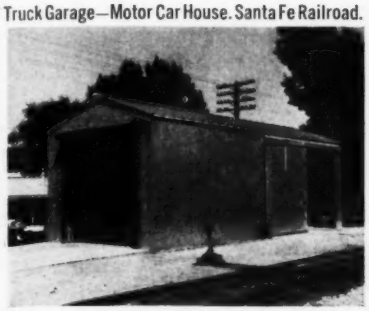
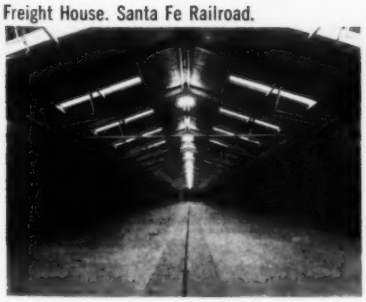
Truck Garage—Motor Car House. Santa Fe Railroad.



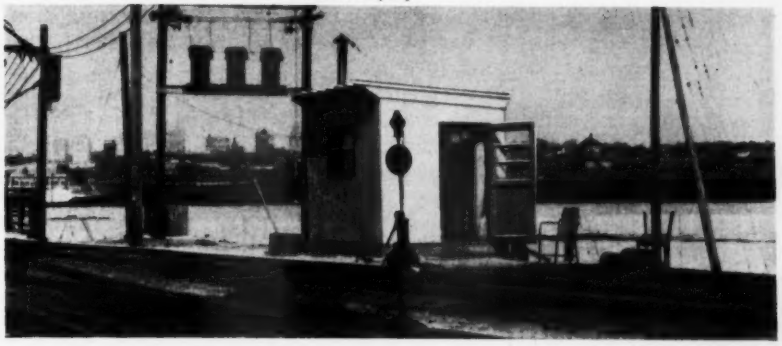
Depot. Northern Pacific Railway.

Freight Platform. Atlantic Coast Line Railroad.

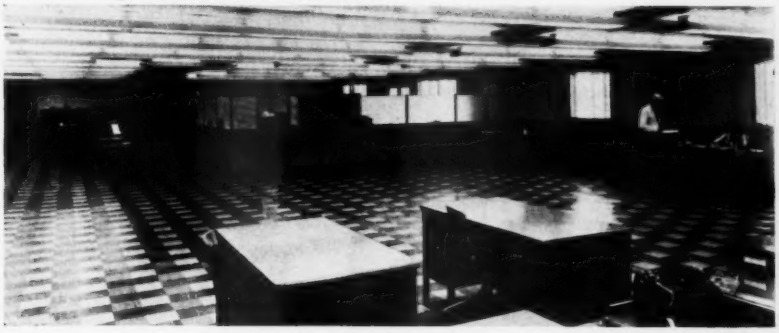
Freight House. Santa Fe Railroad.



Switchman's House. Union Pacific Railroad Company.



Office Building. Louisville & Nashville Railroad.



Wheel House. Western Pacific Railroad Company.

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now in the track, slow orders can be shortened considerably.

In the days of hand adzing it was very desirable that one rail be laid at least one full day ahead of the second rail. This timing permitted new tie plates to be properly seated by trains. With the use of power adzers, especially when two and three are run over the ties, the tie plate bed must be almost perfect and trains passing over the newly laid rail do not move it either in nor out.

The real disadvantage of the larger gangs is that they must of necessity be large enough to have the rail layer and similar machines working to full capacity in order to be fully efficient. This means that back tracks or sidings, in most cases, cannot hold the camp equipment. It also means that a siding has to be tied up. However, with the coming of trailer camps and trucks used for transporting men and machines, this should no longer be a disadvantage.

Not practicable

By F. E. HUDDLESTON, JR.
General Supervisor Track
Chesapeake & Ohio
Huntington, W. Va.

From my point of view, it is not practicable to relay rail out of face on both sides simultaneously for any reason. To begin with, this method requires two complete sets of rail-laying machinery, two crews of men, and, where they are housed in camp cars, too many camp cars for most sidings. Also, this method requires staggering the starting times in order to avoid non-productive man-hours caused by one crew waiting for the other to get a sufficient distance ahead.

There is also the problem of transportation. In some instances where there are no roads adjacent to railways for buses or trucks, all crews must be transported by motor cars. The majority of this type of rail laying is done on a system basis. Since the men often reside a great distance from the place of their work, they will put in the entire working days in one-half consecutive payroll, giving them a greater number of days off at one time. This requires additional passenger cars on regular passenger trains to transport these men to their homes, causing additional problems for the Transportation department.

There is also a problem of laying switches. If switches are not laid in advance, it causes lost man-hours by the second crew while the first crew is getting started (it takes at least one hour for the first crew to do their part). Consequently, they would not have gained sufficient distance ahead for the second crew to start on time.

The labor agreement presents another problem in regard to overtime. For instance, the agreement states that the oldest available man must be given preference for overtime. If overtime is involved by men in the second crew, and there is a man in the first crew with more seniority, the oldest man would be entitled to the overtime and could file a claim even though the younger man did the work.

There is usually a morale factor involved in two crews of men of this type. This can also result in a big loss of productive man-hours. For instance, one crew elects to work in inclement weather; the other crew elects not to work. If mechanical delays should occur in the first set of machinery this also could result in several hours of delay for the second crew.

Also, using two crews involves having a main-line track out of service for nine hours or longer instead of eight hours. It is not always possible, from an operating standpoint, to give the track up at the appointed working time of the crews. This would result in a delay for both crews. In addition, due to a heavy volume of traffic, it is not always possible to have a track out of service for an additional hour each day.

There are few advantages of relaying rail on both sides simultaneously to my knowledge. However, in laying rail by this method, it would reduce the number of days the track would be out of service. Thus, the rail-laying program would be finished in half the normal time. It would release the crews for surfacing programs that can only be done during the summer months in some parts of the country. Also, this method would give time for the machinery to be repaired during the period rail is not being laid.

Removing cuttings from tunnels

How can the shoulder and undertrack ballast be cut out, loaded and removed from tunnels most economically? Describe procedure and equipment. What is a reasonable cost per cubic yard or track-foot for doing this work?

Why question was asked

TO THE EDITOR:

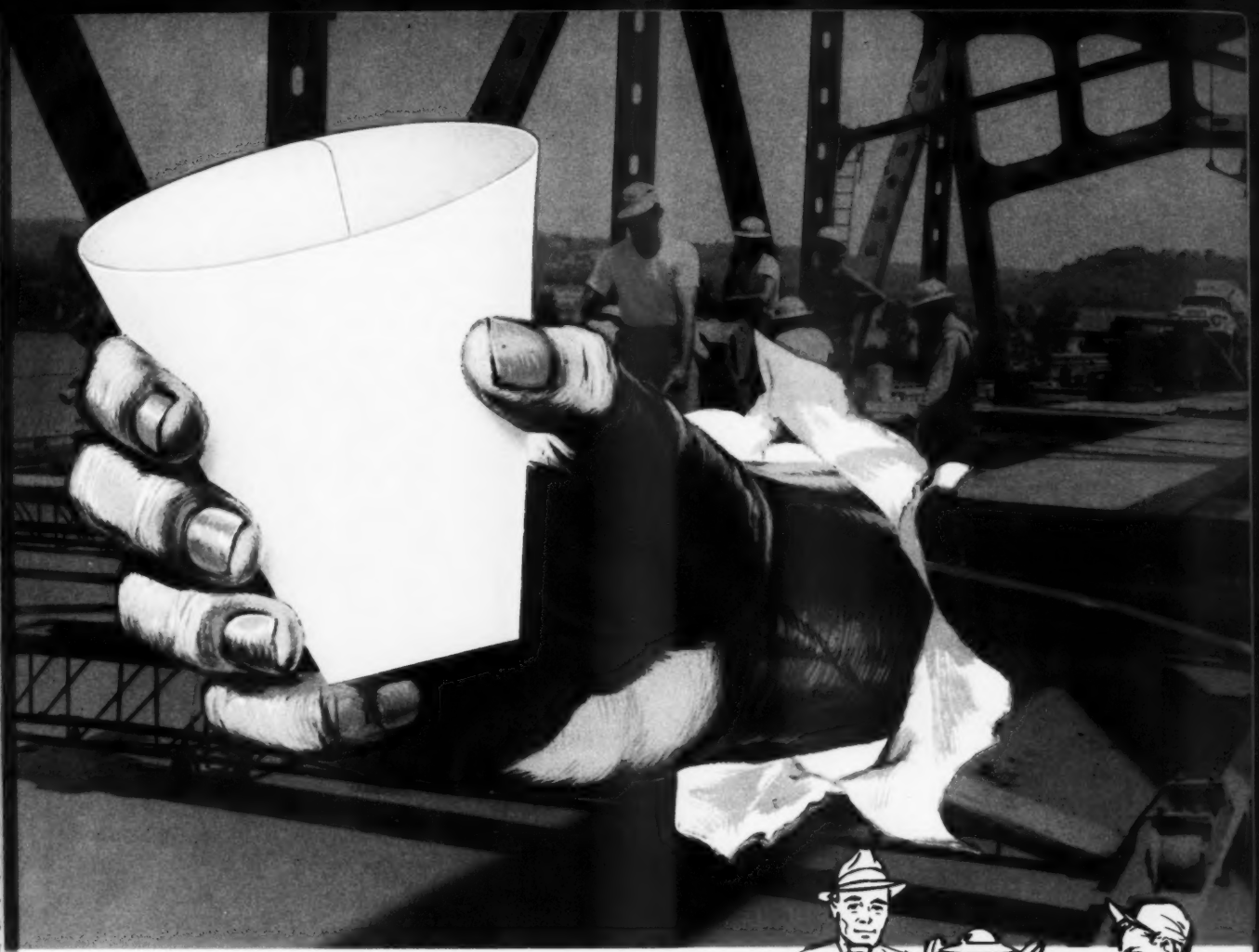
Many Class I railroads have a large number of tunnels, many of which are single-track. Our line averages one tunnel for each five miles of main track (we have 55 tunnels in 276 miles). Fifty years of operation, 45 of which were with steam power, have not only fouled the shoulder and undertrack ballast but also has resulted, through repeated surfacings, in the overhead tunnel clearance becoming restricted.

The problem is: How can this shoulder and undertrack ballast be cut out, loaded and removed from the tunnels? Also, what is a reasonable cost per cubic yard or track-foot for doing this work?

There has been some discussion on this problem in the past. However, with the advent of more efficient undercutting machines and devices, it seems to me that the problem of loading this material and getting it out of the tunnel for disposal has not kept up with the undercutting. Maybe some roads have solved this problem, but I must admit that we have not. Our attempts have been both slow and, in my opinion, costly.

J. M. SALMON, JR.
Chief Engineer
Clinchfield
Erwin, Tenn.

[Here is a problem that is prevalent throughout the country. Several maintenance engineers were contacted, but most of them replied that they had not yet arrived at a satisfactory solution. Two answers were received for publication and these are printed below. However, Mr. Folk states that he purposely omitted cost figures for



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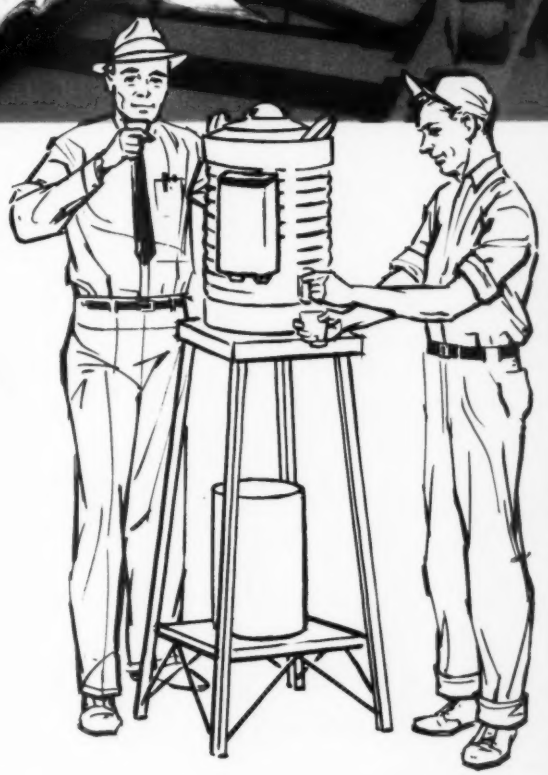

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3. Right shoulder strap hooks easily and conveniently under edge of tank.
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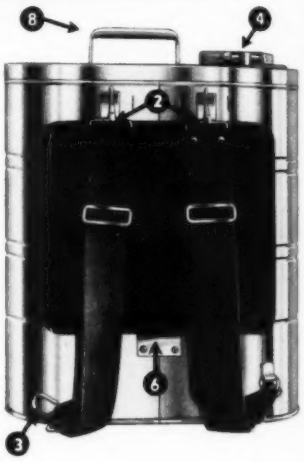
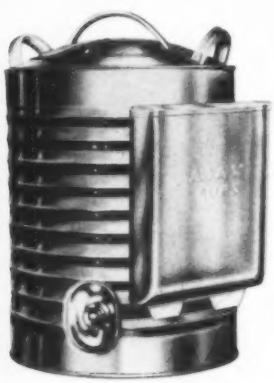
5. Sturdy Chrome-plated Brass push-bottom faucet.
6. Form-fitting ventilated plate on back protects carrier from chill and condensation.
7. Steel AJAX Dispenser holds 300 cups. Firmly attached.
8. Large handle lets carrier hold tank like a suitcase.
9. Easily emptied receptacle for waste cups in bottom of tank.



No. 4P-15 — Weight empty 11 lbs. Capacity approximately 5 gallons Dimensions 17" high, 14½" wide, 7¾" deep

• AJAX Insulated Heavy Duty Water Cooler



AJAX Insulated Heavy Duty Water Cooler provides the finest cold water service available for use in the field. Features include:

Corrugated All-Steel construction gives greater strength and durability.

Heavy Duty Insulation top, bottom and all sides, keeps water cooler longer.

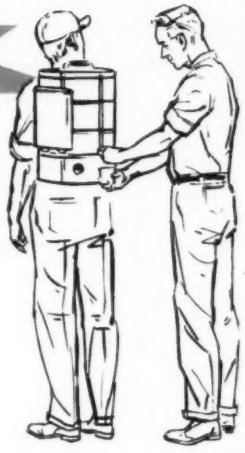
Perfect Fitting Lid fits securely, keeps out dust, prevents contamination.

Recessed Spigot eliminates danger of breaking off, helps insure positive sanitation, drains without spillage.

Special Bottom Support holds cooler in shape, prevents center sag.

Steel Ajax Dispenser holds 300 cups. Firmly attached.

Easy to sterilize and keep CLEAN.



No. 4S-355 — Weight empty 16 lbs. Dimensions Outside Height 19½" Outside Diameter 13¼"
Capacity approximately 5 gallons

• AJAX Dispensers

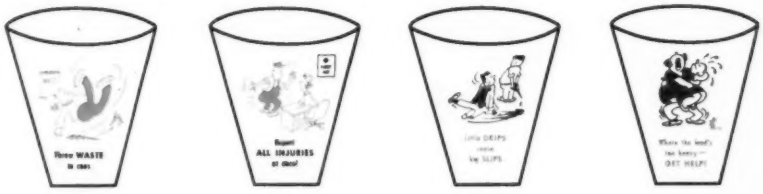
Made of steel, finished in durable enamel. *Easily installed* — attached to tank by lugs or wall by screws. *Simply filled* — cups drop into dispenser from carton *without hands touching cups.* May be refilled before completely empty. Dispense 1 cup at a time.

No. 414
For 4 oz. AJAX Cup
For 6 oz. AJAX Cup

No. 454
For 4 oz. AJAX Cup

No. 467
For 6 oz. AJAX Cup
For 7 oz. AJAX Cup

• AJAX Imprinted Safety Slogans



AJAX Cups in all sizes are available for immediate shipment with these typical Stock Safety designs, assorted, in cartons and cases. Your own special messages furnished at a slight additional charge. This is the most effective and economical system yet devised for getting safety messages *read.* Does not require time out for safety reminders.

AJAX CUPS

UNITED STATES ENVELOPE COMPANY

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5650 Hollis St., Emeryville 8, Calif.

his method. Because of traffic interruptions, he does not believe his costs were reasonable.—Editor]

Uses two methods

By R. M. Folk
Assistant Division Engineer
Southern Pacific Company
Sacramento, Calif.

Two methods were recently employed in tunnel cleaning operations:

(1) Cleaning tunnel out with tractors and carryalls after track has been dismantled and removed.

(2) Using Southern Pacific Company's own Bean Tunnel Cleaner and Cribexes.

Where operating conditions permit, we favor Method No. 1 because we feel that a 100-per cent job is accomplished. Also the grade usually can be lowered sufficiently to accommodate a subsequent raise when conditions again require it.

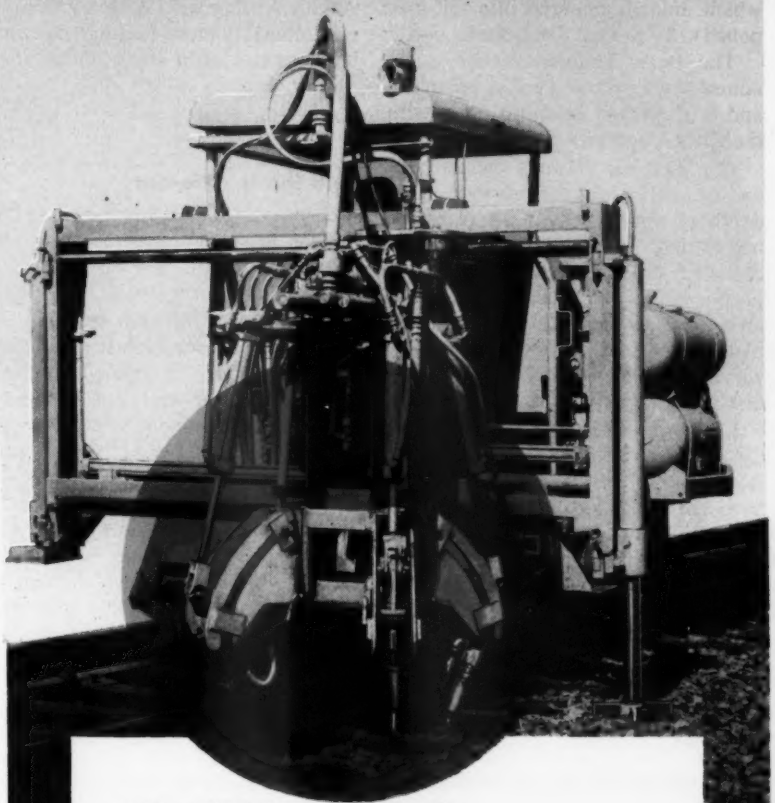
We find that a disproportionate amount of time is required to accomplish dismantling and removal, and particularly the rebuilding of the track. In this connection we are presently considering squaring joints and removing and re-assembling the track one rail length at a time, using an American diesel-electric crane.

Carryall operation is very efficient when the bottom of the tunnel is paved and carrying the grade is not a necessity.

There are a number of variables to be considered in the employment of tractors and carryalls in a cleaning operation. The tunnel length should be adaptable to this method; there should be adequate room at each end of tunnel for the equipment to turn around; and there must be suitable location for disposal at each end.

When operating conditions will not permit removal of the track, Method No. 2 is employed. The Bean Tunnel Cleaner cuts a 28-in ditch from a point 6 in outside the edge of the ties to a depth of 14 in below the top of tie. The machine consists essentially of circular loading cutters which cut a ditch and load the fouled material onto cross conveyors. The material is dumped by a cross conveyor into a common basin. From here it is raised by a bucket elevator to an elevated conveyor belt parallel to the track,

POWERFUL...*Fast*..Versatile



McWILLIAMS
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With hydraulic jacks and air tamping, it provides ballast compaction equivalent to the McWilliams Multiple Tie Tamper. Travel speeds up to 25 mph, and means for setting off quickly. *Write for Bulletin ST-200.*

SPOT SURFACING . . .
Will correct cross level and pick up low joints on both rails with traversing head.

YARD and TERMINAL MAINTENANCE . . .
Tamps 85% of turnouts and has provisions for spiking guns, nutting attachments and other air tools.

WITH TIE GANGS . . .
Completely tamps all new ties a gang can install in a day.

WITH RAIL GANGS . . .
Will tamp all loose ties, keeping up with the gang.

ONE MAN OPERATION

Railway Maintenance Corporation

PITTSBURGH 30, PA.

which unloads material into self-propelled 12-yd and 8-yd dump cars.*

The Bean Tunnel Cleaner is, of course, the key to our entire operation and is employed in conjunction with the Cribex, somewhat as follows:

(1) Ditches between the tie ends and tunnel walls are cleaned to a depth of approximately 14 in below top of ties. It may be necessary, because of the cement-like consistency of the ballast after concrete tunnel-lining operations have been completed, to make two or three passes with the machine to accomplish the first 14 in of ditch.

(2) Cribs are then cleaned with the Cribexes which deposit most of the material in the ditch. After the cribs have been stripped, it will be necessary to make another pass with the tunnel cleaner.

(3) Shift ties to cleaned-out crib location.

(4) Repeat crib cleaning and ditch cleaning operation as necessary to carry job to completion.

* See January 1956 issue Railway Track & Structures.

We have not had a track undercutter available so we must move the ties to remove the material beneath them. At this writing we feel that it is more economical to move ties than pay minimum rental on a track undercutter.

Each job is different

By J. T. COLLINSON
Division Engineer
Baltimore & Ohio
Baltimore, Md.

In undertaking the cribbing of shoulder and track ballast in tunnels, each job should be studied carefully to determine the best and maximum amount of equipment which can be utilized. Many types of conventional equipment are useless because of clearance restrictions. But they should be thoroughly investigated to find out if partial use can be made of them.

In double-track tunnels the initial job is cleaning the ballast from the cribs and placing it in position for disposal. Cribexes or other cribbing machines can often be utilized to remove ballast from the center ditch portion and may likewise be used for the entire cribs should side wall clearances be sufficient. Where clearances restrict the use of cribbing machines, hand methods must be utilized. Even with hand cribbing, it may be of assistance to utilize pneumatic tools to break up ballast that is cemented.

In loading and disposing of the cribbed ballast in double-track tunnels, it is generally possible to use small-type cranes in work trains to load ballast. Should overhead clearances prevent the use of gondolas for handling the ballast, then flat cars with removable side boards may be necessary to provide sufficient room for the crane boom and bucket.

In certain single-track tunnels with restricting clearances, the use of both cribbing machinery and cranes is impossible. In these cases all of the work must be done with hand tools. In loading the cribbed material, push trucks with hydraulic dump beds are of assistance and should be used.

The cost of this type of work will vary with each job due to the varying conditions. But the most economical method will result in the use of any available equipment which can be used consistent with the existing clearance conditions.

Screw spikes for guard timbers

What are the advantages, if any, of the use of screw spikes in lieu of lag bolts for fastening guard timbers to bridge ties? Explain fully, taking into account the economics, mechanics and method of installation.

Matter of economics

By W. E. MANNING
General Superintendent—Chief Engineer
Tennessee Central
Nashville, Tenn.

In my opinion the chief advantage in the use of drive screw spikes, in lieu of lag bolts for fastening guard rail timbers to bridge ties, is economics.

If the bridge ties and guard timbers are pre-bored prior to treatment, the application of the drive screw spikes does not require any special tools. On the other hand, lag bolts require either a power or hand wrench for application. There is also a decided advantage in the use of drive screw spikes in lieu of lag bolts when guard timbers are removed, inasmuch as the drive screw spikes can be removed much faster, and with greater ease, than the lag bolts. The drive screw spikes also do less damage to the fibers of the timber than the lag bolts.

Prefers boat spikes

By E. E. BURCH
Bridge Engineer
Chicago, Milwaukee, St. Paul & Pacific
Chicago, Ill.

Since the guard timbers, or "spacer timbers" as I describe them, are the most expendable part of the bridge floor and are subject to mutilation and replacement from almost any cause, including wrecks and fires, I do not see any advantage in using screw spikes or lag bolts.

I have three types of floors that are put on bridges, and the fastenings will be described under each type as follows:

On steel bridge floors, which are permanent and where the alinement of track is easy to keep, I bolt every other tie, except those on curves where every tie is bolted. I use large-head bolts extending through both the spacer timber and the tie and connecting to the steel with a metal clip. The unbolted ties are fastened to the spacer timber with two double-grip spikes driven home.

On permanent creosoted open-deck timber-pile trestles, I bolt the spacer timber at every fourth tie with large-head bolts. I fasten the intermediate ties with two ⅜-in boat spikes, driven home. The lining spikes in the ties are ½-in boat spikes and project 1 in above the top of the wood surface.

When a new creosoted deck is installed on old bents which will need redriving in a few years, it will be necessary to remove the spacer timber to open the floor for driving the new piles. The use of boat spikes instead of screw spikes or lag bolts will permit easier removal of the 4-in spacer tim-

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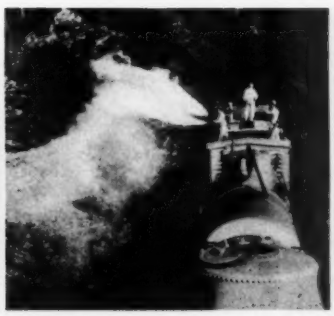

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New Magneciter Generator gives important performance advantages*

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All models are powered by heavy-duty industrial engines matched to the power requirements of the generator. Custom modifications to meet the needs of particular applications add to the versatility of the new Onan line. Automatic controls for standby installations are available for each model.

All plants 100KW and larger are Magneciter-equipped

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- **Lighter weight, more compact** — Plants are shorter by a foot or more, lighter in weight.
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**Onan alternator with static excitation and static voltage regulation.*

Specification kit available now! Write for it!

Onan builds electric plants from 500 watts to 150KW, gasoline-powered; 3,000 watts to 200KW, Diesel-powered.

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What's the answer? (cont'd)

ber. On this type of floor renewal, the boat spikes are left projecting about 1 in to permit pulling with a claw bar and reusing the timber as well as the hardware. The rupture damage to both tie and spacer timber is much less than when screw spikes or lag bolts are used.

The original cost of boat spikes is less than for the screw spikes or lag bolts, and the easier removal makes for a higher salvage rate for timber as well as hardware. The bolthead projection above the 4-in spacer timber is low enough below the top of rail to eliminate, to a large degree, damage to the structure by dragging equipment or snow plows.

Breaking in work equipment

What precautions should be taken before putting a new machine to work at its full capacity? Should it go through a "breaking-in" period? Explain.

No break-in required

By J. M. GILES
Supervisor, Railroad Section
Sales Development Division
Caterpillar Tractor Co.
Peoria, Ill.

Purchases of new machinery for railroad roadway maintenance program work should expect full-load productivity on delivery.

The "field breaking-in-period" for new machinery is an archaic practice, which has survived the steam engine era. Lack of precision tools, quality control and the basic design of steam engines required field break-in to secure full-load productivity.

Today's purchaser of new machinery should not be burdened with the manufacturers' duty of "breaking in." Caterpillar engines and tractors undergo break-in periods on engine test racks and tractor run-in floors. After servicing by Caterpillar dealers at delivery, Cat units are ready for full-load productivity.

Cat dealer servicemen, when delivering a unit to the purchaser in company with purchaser or his representa-

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Help combat rising operating costs by reducing maintenance costs and time—by specifying Eaton-Reliance Hy-Crome Helical Spring Washers on all your bolted assemblies. Because these rugged spring washers are engineered to the specific requirements of railroads, and are manufactured to the highest quality standards, they give you reliable service longer. The payoff is in fewer maintenance trips down the track, fewer inspections of bolted assemblies on rolling stock. You save labor and time.

Eaton-Reliance Hy-Crome Spring Washers are engineered to give more tension over a greater reactive range to compensate for thread wear, bolt elongation and metal stress caused by excessive vibration. Quality is unsurpassed—and they are backed by years of usage in millions of applications on leading railroads. To learn more about the advantages of Eaton-Reliance railroad spring washers, write for Engineering Bulletin R-53, or request a call from one of our representatives.

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What's the answer? (cont'd)

tive, check all adjustments, the oil level in all oil compartments, and also look for loose nuts or bolts.

Owners, operators and servicemen should be conversant with the manufacturers' manuals covering the operation, servicing and repair of new machinery. Such manuals represent the manufacturers' sincere effort to guide the owner in attaining the utmost in economical productivity.

Eight hours enough

By C. E. REID
Supervisor Work Equipment
Canadian National
Moncton, N. B.

I recommend a short break-in period of not more than eight hours depending on the complexity of the machine, under the supervision of a representative of the supplying company. During this time the oil charts, maintenance regulations, and other instructive literature pertaining to the operation and maintenance of the machine, should be thoroughly explained and demonstrated to one or more supervisory personnel and future operators.

The reason for the above recommendation is to dispense with future correspondence regarding warranty and improper use of the machine.

In a department using a large number of various types of machines produced by companies in Canada, U.S.A., Austria, Switzerland, and other countries, it is vitally important that each supplier be given every opportunity to impart specialized information regarding the equipment being supplied with the end in view of obtaining the maximum service from the product.

Need factory representative

By V. W. OSWALT
Superintendent Maintenance Equipment
Central of Georgia
Macon, Ga.

It is my opinion that this subject should not be covered by generalities. This is due to the many types and sizes, as well as uses, of equipment purchased by railroads.

All equipment should be set up and serviced by a factory erection engineer or service engineer. This factory representative should spend a few days with each machine, making sure the equipment is properly adjusted for handling the type work it was designed to handle and for which it was purchased. Also, he should instruct an operator and mechanic as to the correct operation and maintenance. The representative should also be in position to recommend a minimum list of repair parts needed to protect the equipment over a period of six months, or more. Further, the manufacturer should have a representative make a recheck of the machine at the end of a 90-day period. This check is very valuable to the user in that the operator and mechanic will then have numerous questions that should be answered by a representative from the factory.

A "breaking-in" period is involved during the time a factory representative is with the equipment, which also involves a warranty provided by the manufacturer. The well known "breaking-in" period has been greatly reduced due to the precision built machines we now receive.

These portable pumps prime at 30 feet lift!

These rugged new pumps prime and reprime at lifts up to 30 feet. Move easily because of light in weight aluminum construction.

Four models:

Midget	1½"	6,500 GPH	2.25 HP
Pelican	2"	8,500 GPH	2.75 HP
Hawk	2"	12,000 GPH	5.5 HP
Eagle	3"	18,000 GPH	6.8 HP

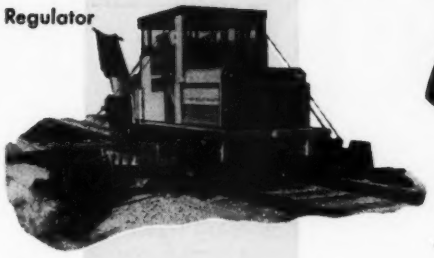
Pump at rest—Captured liquid retained for priming. Note no check valve.

Priming action—Entrained air (B) escapes at (A) to be discharged. Priming liquid returns (C) to entrain more air.

Pumping action—Straight-in suction voids entrance restrictions. Water enters direct to eye of impeller. Sediment is purged.

THE GORMAN-RUPP COMPANY
305 Bowman Street, Mansfield, Ohio

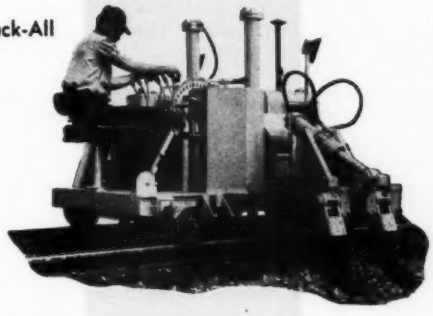
Ballast Regulator



KERSHAW PRESENTS . . .

a COMPLETE Track Reconditioning Package

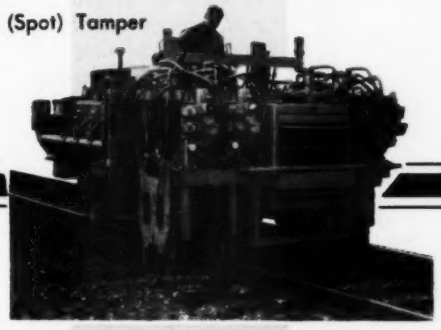
Jack-All



Tie Replacer

Track Crane

Multiple (Spot) Tamper



NOW . . . Kershaw presents a new track reconditioning package of 5 proven machines which are ideal for any railroad whether it be Class I or Short Line. And at a surprisingly low cost which insures that the machines will pay for themselves in savings in the very first year.

The machines are the Kershaw Ballast Regulator, Jack-All, Tie Replacer, Track Crane and Multiple (Spot) Tamper. Individually, they can perform dozens of different operations on any railroad. Used in the reconditioning package, they line up like this:

1. The Kershaw Ballast Regulator first plows ballast away from tie ends.
2. The Kershaw Jack-All then raises track to the desired height and catches off track.
3. The Kershaw Tie Replacer removes old ties and, if necessary, scarifies tie bed.
4. The Kershaw Track Crane inserts new ties, stacks old ties on the side of track and, if necessary, redistributes new ties.
5. The Kershaw Multiple (Spot) Tamper then tamps the track, and
6. The Kershaw Ballast Regulator returns to provide the final dressing.

For additional details, contact a Kershaw representative, or write or call

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Merits of plastic panels

What are the advantages of corrugated translucent plastic panels for use in roofs and walls of railway buildings? Disadvantages? Do they present any problems of installation or maintenance? Explain.

Have several advantages

By S. G. URBAN
Architect
Texas & Pacific
Dallas, Tex.

Corrugated translucent plastic panels provide an excellent way of providing daylight in a building. When the panels are located in roofs or walls, or in both places, they admit light without glare from the sun in a most economical manner. This is particularly true when used in connection with corrugated iron, aluminum or cement-asbestos.

The panels are more economical than conventional windows or special skylights. Since the material is not subject to the breakage common to glass it reduces maintenance to a minimum. The material in full-sheet sizes is light in weight so that handling is no problem. The plastic can be cut with a saw and drilled without difficulty. The panels can be set without frames in a watertight manner by nesting the corrugations with corrugated siding or roofing materials. Watertightness can be expected in roof pitches of 4 in. in 12 in. or over, but flattening the pitch increases the hazard of leakage. Flat roof coverings of corrugated plastic have been known in some geographical areas and climatic conditions to create condensation on the bottom side.

Plastic panels cannot be compared to conventional windows when ventilation is required in addition to lighting. The panels are stationary and the material is opaque, preventing vision through it.

Improvements have been made in the composition of the material by many manufacturers to prevent clouding-up, cracking and peeling, which were common to some of the first applications a few years ago. Some of

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Coblax in bags is another Esso product designed to reduce railroad operating expenses through lower maintenance and labor costs. Outstanding service and technical assistance are readily available through your Esso representative. For further information, write: Esso Standard Oil Company, Railroad Sales Division, 15 West 51st Street, New York 19, N. Y.

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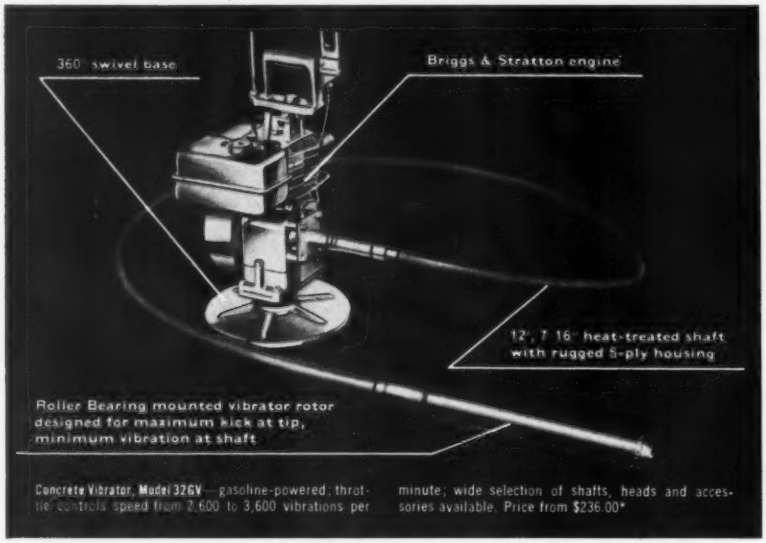
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Briggs & Stratton engine
12", 7 16" heat-treated shaft with rugged 5-ply housing
Roller Bearing mounted vibrator rotor designed for maximum kick at tip, minimum vibration at shaft

Concrete Vibrator, Model 32GV—gasoline-powered; throttle controls speed from 2,600 to 3,600 vibrations per minute; wide selection of shafts, heads and accessories available. Price from $236.00*

Air Circular Saw, Model P128—12" blade; 2½ hp; safe from shock around wet piers and wharfs. Cuts to 4⅛" at 90° and 3⅛" bevel. With case, blade and hose. **Price $345.00***

Air Drill, Model PD-508G—½" chuck capacity, 4-vane rotary motor; built-in automatic oiler and quick-acting governor; rugged, lightweight: 9½ lbs. **Price $210.00***

Sump-Pump Attachment, Model 53533—4-spline drive attaches to Model 32GV vibrator (above); pumps 30 gals. per minute against 10' head at 3,200 rpm. **Price $45.00***

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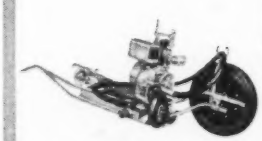
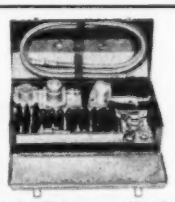


Combination Rail Grinder, Model 23—Wheelbarrow-mounted 9-hp engine with outrigger for mounting on rails; can be used with many accessories. Prices on request.



Mechanics Maintenance Kit, Model MM-43—Air-powered (Model MM-40: electric-powered) impact wrench with multi-purpose accessories. **Price $395.50***

CHOOSE THE POWER MOST EFFICIENT FOR YOU. REMINGTON POWER TOOLS ARE AVAILABLE IN **AIR · ELECTRIC · GASOLINE AND POWDER ACTUATED MODELS**

Remington

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DU PONT

FREE POWER TOOL CATALOGS RT-2

Remington Arms Company, Inc., Bridgeport 2, Conn.

Please send—without obligation—catalogs on Remington Contractor & Industrial Tools checked below:

☐ Electric Tools ☐ Air Tools ☐ Flexible Shaft Machines ☐ Concrete Vibrators ☐ Chain Saws ☐ Stud Drivers

*Name*_____ *Position*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

Specifications and prices subject to change without notice.

What's the answer? (cont'd)

the newer materials carry the Fire Underwriters label that makes them more acceptable where some protection from fire is desired and where city codes may require it.

The material is available in different colors, but plastic sheets other than the commercial grade of green are higher in cost, and generally reserved for decorative purposes.

Give good results

By W. F. ARMSTRONG
Engineer of Buildings
Chicago & North Western
Chicago, Ill.

Corrugated translucent plastic panels may be used either in new construction or maintenance work, in roofs, walls and skylights.

In new construction the panels are most useful in roofs or walls of shop-type structures constructed of one of the several different designs of corrugated metal or asbestos-cement panels. The translucent plastic panels are manufactured to match these various designs of corrugated metal, and the use of plastic panels provides an economical method of furnishing natural light. The panels may also be used with other types of construction, or for special architectural effects.

A considerable number of improvements have been made recently in this material to make it more fire resisting, fade resistant, and more durable.

Special accessories, such as lap cement, closure strips, flashing and fasteners, should be used with the material for satisfactory installation.

Some of the advantages of the material are:

(1) A wide choice of corrugations and colors.
(2) Shatterproof in ordinary service.
(3) Lightweight.
(4) Provides good light diffusion.
(5) Is easily worked with common hand and power tools.

Some of the disadvantages are:

(1) Has a high coefficient of expansion, which tends to warp panels during hot weather, giving them a "wavy" appearance. If panels are not fastened well to framing, the fasteners tend to pull out.
(2) It is difficult to get a tight fit between panels and closure strips.

We have used translucent plastic panels for a number of years in both new and maintenance work on roofs, siding and skylights and to date have had generally satisfactory results.

Stringlining curves graphically (cont'd)

(Continued from page 33)

continue our summation line to Sta. 4. This procedure is followed to the end of the last plotted point (in our example to Sta. 24). Where there is no arrow, either up or down, as at Sta. 9, 11 and 12, the line is continued one more station in the same direction as the last joined stations.

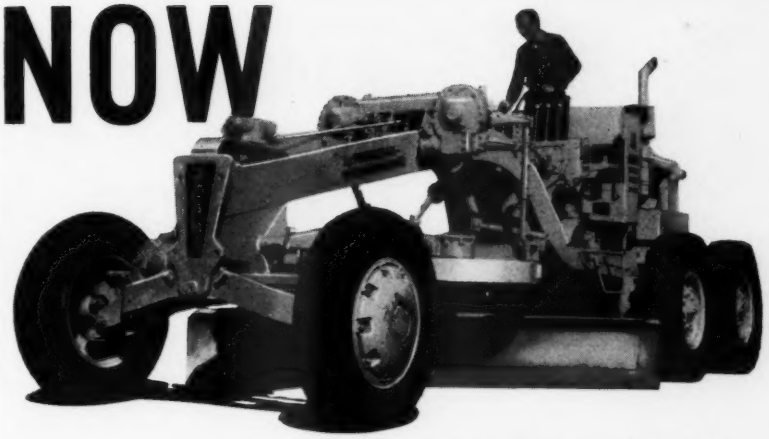
The track throws, necessary to change the irregular curve to a smooth curve, equal the number of units at each station that the summation line is above or below our base line "B-B." If the summation line is above the base line, the track throws are inward, or minus; if below the base line, the throws are outward, or plus. Base line "B-B" may be considered as a preliminary throw-line.

An inspection of the graphed summation line (Fig. 5) shows that most of the throws from base line "B-B" are inward. As this method is based on the half-throw system, the full track throws are twice the number of units shown. It is obvious that the throws called for by our summation line are impracticable. What we want is a line where the inward throws will approximately balance the outward throws. Hence, we must make a correction to obtain this result.

A visual inspection of our summation line in Fig. 5 shows that we would have a better balance between in and out throws if a throw line was about three units higher than base line "B-B." Such a line would pass somewhat regularly through the peaks and valleys in the summation line and would coincide with the summation line at Sta. 22, 23 and 24.

To obtain this more favorable throw line, we will take the liberty of revising the arrows at two stations, thus changing the revised ordinates at these stations. A "down" throw-line arrow is placed within a circle at Sta. 1 as shown in Fig. 5. In plotting the course of the throw line, however, the newly placed "down" arrow at Sta. 1 calls for an "up" turn of the dial of the Stringliner. Starting at Sta. 1 on base line "B-B," we draw a broken line on this one "up" slope and find that it is three units above the base line at Sta. 4. Since this is the new throw-line position we are after, we place another throw-line arrow, but this time in the

NOW



...this 115 hp grader saves you more than $1000

The low first-cost of this heavy-duty Adams* 440 grader saves you more than $1000 in out-of-pocket expense. Priced a good $1000 less than comparable 115 hp graders, "440" not only keeps your investment in M/W equipment low, but also reduces the cost of work on your rights-of-way, yards, and roads.

100% anti-friction drive. Anti-friction bearings in transmission, final drive, and tandems deliver a greater proportion of engine power to tandem wheels ... give you more push-power from 115 hp. Long bearing life cuts maintenance cost and downtime.

Big value for the money

Though economy-priced, this 115 hp full-diesel Adams is a top quality grader, complete and ready for work. Grader weighs 22,795 lbs.; is equipped with 13.00-24 tires on 4 tandem wheels, 9.00-24 on leaning front wheels. Slide-shift type 12′ x 25″ moldboard is operated by Adams engineered power controls that move blade at constant speed — no matter how many control levers are worked at same time. Standard equipment includes key-turn electric starting, upholstered seat, muffler, and special tools.

Extra work-power ... no added cost

You'll get up to 30% more work done with an Adams 440. Here's why:

12-speed transmission. Also, three optional creeper gears at nominal cost. With more working gears, your grader can always operate at, or near, full rpm ... develop maximum push-power at time-saving speeds. Reverse gears to 13.2 mph cut cycle-time on one-way work. Road speeds to 25.2 mph get you job-to-job with minimum lost time.

Rubber engine-mounts. Engine vibration is isolated from grader and operator ... to cut maintenance, adjustment, and downtime ... reduce operator fatigue; and thus increase output.

High-arch front axle. You get 24″ clearance for straddling high and wide windrows of material, without bulldozing and wasting power.

Choice of engines. Select Cummins or GM 115 hp diesel ... whichever is better for your operation. This lets you standardize engines in your fleet ... for faster, easier servicing ... for maximum work-time and output.

Optional Work Attachments. Bulldozer, V-type Scarifier, Push Plate, Power-shift Moldboard, Snow Plow, Snow Wing. With this additional equipment your L-W Adams 440 can do even more work at extra savings.

Ask us to prove to you how an Adams 440 grader gives you extra work-power ... at a saving of more than $1000 in your M/W equipment budget.

*Trademark G-1673-RR-2/3

LeTOURNEAU-WESTINGHOUSE COMPANY
Railroad Sales Division
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit

RBI MEMBER

ON THE JOB
. . . ON THE TOUGHEST JOBS
ARCTIC BOY
portable water coolers

. . . built to take a beating on construction jobs, in mines, on the farm, railroad crews, on service trucks . . . wherever men work and the going is rough.

They keep drinking water cool and sanitary, keep worker efficiency up. And note these features:

- HOT DIPPED Galvanized or stainless steel insets
- Sparkleen plastic liner . . . non toxic, prevents corrosion
- Large opening, easy to ice and clean
- Extra large insulation space

Send for free booklet "Care and Use of Your Cooler." Write Dept. C-5

Deluxe

SCHLUETER MFG. CO. St. Louis, Mo.

QUICK STARTS FOR COLD ENGINES*
ALL YEAR . . .

DOWN TO 65° BELOW ZERO

Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

SPRAY PRODUCTS CORPORATION
P. O. Box 844 • Camden 1, New Jersey

Stringlining curves graphically (cont'd)

"up" direction, at Sta. 4. By again turning the dial of our Stringliner one turn in the opposite direction to the arrow, we continue to draw our broken line to where it joins the summation line at Sta. 22.

The final throws now equal the number of units that the summation line of Fig. 5 is above or below this broken line. These are read and shown below Fig. 5. It must be remembered, however, that we are using the half-throw system so that the full throws are double the number of units shown.

Final revised ordinates will be as shown in Fig. 4, excepting at Sta. 1 and 4. Because of the throw-line arrows the final ordinates will be minus one (—1) at Sta. 1 and plus one (+1) at Sta. 4.

We now want to check our work for accuracy. This is done by drawing a check line in the same manner that we produced the summation line, except that we must also take into account the added throw-line arrows. The introduction of throw-line arrows at Sta. 1 and 4 affects the original arrows of these stations. The "down" arrow at Sta. 1 adds one more to the original arrow. The "up" arrow at Sta. 4 cancels one of the "down" arrows at that station, leaving a net of two "down" arrows.

Starting on a new base line "C-C" at Sta. 0 (Fig. 6), where there are no arrows, we draw a horizontal line to Sta. 1. The new number of "down" arrows at the latter station is now two, so we turn our dial clockwise two detents and draw a line to Sta. 2. At this station we find one "up" arrow, so we turn the dial up one detent and continue the line to Sta. 3. At this station we have three "up" arrows, so we turn the dial three detents up and continue our line to Sta. 4. Here, we have applied the other throw-line arrow, leaving a net of two "down" arrows. We again turn the dial two detents downward and draw the line to Sta. 5. This procedure is followed to the end of the curve.

Upon completion of this check-line, observe the "in" and "out" throws from base line "C-C" and compare these with the throws recorded in Fig. 5. If all are the same at all stations all previous work is correct.

WEED CONTROL by UROX®

Sensational Granular Herbicide Gives Longer-Lasting Control... *at Lower Cost!*

Railroads all over the country are finding they can control weeds and brush faster, easier, for a longer time and at lower cost with General Chemical's UROX Weed Killer.

Long-term control! Even in areas of heavy rainfall, UROX will usually maintain control of weeds for an 8-month period. In areas of lighter rainfall, control may remain effective for as long as 18 months after a single application.

Effects are cumulative! UROX tends to build increasing soil sterility. Its herbicidal action can thus be extended from one year to the next with small booster doses. As smaller and smaller amounts are used over a period of time, you realize substantial savings.

Amazingly effective! Granular UROX is a "root-seeker." Apply it to dense vegetation or heavy top growth—the granules roll off leaves onto the ground, where killing ingredients penetrate the soil and are absorbed by plant roots. Also, UROX controls so many different, stubborn weeds that there's no need for separate herbicidal treatments. UROX does the *entire* job!

You get fast results! You can see control in as little as 10 to 14 days.

Cuts labor costs, too! Fewer applications... no mixing... cumulative effects—they add up to significantly lower costs. What's more, you can apply UROX in the winter, when many maintenance crews are idle.

Get the whole story! Write today for our new full-color UROX folder, "Candidly Speaking." You'll see the unretouched, candid-camera evidence of UROX's effectiveness in many widely separated geographical areas, many different climatic conditions. We'll be glad to send you your free copy on request.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Association News

Northwest Maintenance of Way Club

The next meeting of the club will be held on February 19 at the usual location, the Midway Civic Club, 1931 University avenue, St. Paul, Minn. The program will feature a talk by G. M. Magee, director of engineering research, Association of American Railroads, on "Butt Welded Rail." A panel will also be included composed of representatives of supply firms which handle welding equipment. After Mr. Magee's talk the floor will be open for questions directed to either him or the panel.

American Railway Engineering Association

The annual convention will be held at the Sherman Hotel, Chicago, March 9-11. A skeleton program follows:

Sunday, March 8

Pre-convention registration, mezzanine floor, 11 am–3 pm

Monday, March 9

Registration, mezzanine floor, 8 am

(Grand Ballroom, 9:30–12:00)

Introductions and Greetings
Address by President B. R. Meyers
Report of Secretary and Treasurer
Keynote address by Daniel P. Loomis, President, AAR
Address by Paul Jones, Director of Public Information, National Safety Council
Address by Ray McBrian, Director of Research, Denver & Rio Grande Western
Address by H. H. Hale, Assistant to Vice President—Highway Transportation, AAR AAR

(Grand Ballroom, 2:00–5:00)

Reports of Committees
9—Highways (Special feature)
20—Contract Forms
11—Engineering and Valuation Records
14—Yards and Terminals (Special feature)
16—Economics of Railway Location and Operation (Special feature)
25—Waterways and Harbors

Tuesday, March 10

(George Bernard Shaw Room, 9:00–12:00)

Reports of Committees
24—Cooperative Relations with Universities
Address by R. G. May, Vice President, Operations and Maintenance Department, AAR
13—Water, Oil and Sanitation Services (Special feature)
7—Wood Bridges and Trestles (Special feature)
8—Masonry (Special feature)
30—Impact and Bridge Stresses
15—Iron and Steel Structures

ASSOCIATION LUNCHEON, 12:00 NOON

(Grand Ballroom)

Presentation of gavels to new committee chairmen
Announcement of results of election of officers
Address by B. W. Heineman, Chairman, Chicago & North Western

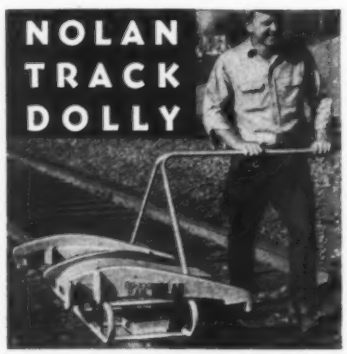
(George Bernard Shaw Room, 2:30–5:00)

Reports of Committees
28—Clearances
29—Waterproofing
17—Wood Preservation
6—Buildings (Special feature)
27—Maintenance of Way Work Equipment
22—Economics of Railway Labor (Special feature)
3—Ties (Special feature)

Wednesday, March 11

(Grand Ballroom, 9:00–12:00)

Reports of Committees
Special Committee on Continuous Welded Rail
4—Rail
5—Track (Special feature)
1—Roadway and Ballast (Special feature)
Closing Business Session
Installation of officers



You can get rails, ties, supplies, tools, rerailers, etc., to the job with money-saving speed and efficiency, when you equip your crews with the Nolan Track Dolly.
Built of tubular high-carbon steel. Extremely strong and serviceable. Operator's handle conveniently placed to assure correct balance and full control of heavy loads.

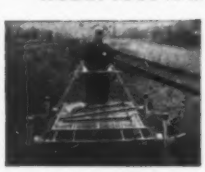
STANDARD DOLLY

Length	Width	Ht. Above Rail	Weight
50½ in.	15½ in.	6⅝ in.	88 lbs.

INSPECTOR'S DOLLY

Length	Width	Ht. Above Rail	Weight
36 in.	14 in.	6 in.	60 lbs.

NOLAN TOOL AND SUPPLY CAR



2000 lbs. capacity. All-tubular high-carbon steel construction for safe carrying of ties, rails, supplies, etc. Car breaks conveniently in center into two sections.
Platform size 48" x 45" Ht. above rail 8" Weight 140 lbs. complete.

Write for complete railway supply catalog.
THE NOLAN COMPANY
166 PENNSYLVANIA ST., BOWERSTOWN, OHIO

Supply Trade News

BUCYRUS-ERIE — The **Construction Service Equipment Company** of Omaha, Neb., and North Platte has added Hydrocranes to the line of excavating and crane equipment that it distributes for Bucyrus-Erie. The distributor now offers sales and service on the full line of Bucyrus-Erie ⅜ to 4-cu yd convertible excavators and cranes; 10, 15, 25 and 35-ton capacity transit cranes; dragline buckets; and the 5 and 12-ton capacity, truck-mounted Hydrocranes and ⅜ and ½-cu yd Hydrohoes and Hydroshovels. Territory covered by the distributor includes most of Nebraska and part of Iowa. Equipment and servicing facilities are maintained at the distributor's plants in Omaha and North Platte.

D. W. Onan & Sons—The following promotions to newly created positions have occurred in the sales department of this company according to an announcement by **Roy E. Mullin,** general sales manager: **Edwin C. Swenson** to Eastern Regional sales manager, having charge of sales in the territory east of the Ohio and Mississippi Rivers; **Arthur R. Johnson** to Western Regional sales manager, having charge of sales in the western United States and all of Canada; **Paul F. Richardson** to manager, special products division.

P. & M. CO.—Charles J. Miller, vice-president, has been promoted to president of both this company and **Maintenance Equipment Company.** The announcement was made by **Max K. Ruppert,** president and chief executive officer of **Poor & Co.,** of which both companies are divisions.

POOR & COMPANY—Roy A. Lussow, industrial engineer of this company, has been appointed assistant to the president, according to an announcement by **Max K. Ruppert,** president and chief executive officer. Before joining Poor & Co., Mr. Lussow was associated with the international Harvester Company and Motorola, Inc.

WHITE MANUFACTURING COMPANY — The following changes in eastern sales representation have been announced by **W. McK. White,** president of this company: **Edward R. Mason** has retired after 45 years as railway sales representative for this and other companies; **Robert J. Passani** will now represent White Manufacturing on eastern railways. His office is located at 2034 Grand Central Terminal Building, New York.

Woodings-Verona Tool Works—R. J. McComb, 74, vice-president and sales manager of both this company and **Woodings Forge & Tool Co.,** with headquarters at Chicago, has retired, effective December 30, 1958, after 30 years service.

Obituary

Walter L. Gunnison, operating manager of the Enterprise Railway Equipment Company, Chicago, died December 24.

C. J. Miller
P & M - MECO

R. A. Lussow
Poor & Co.

In The Yard... OR On The Line

BURRO

WORK POWER PAYS!

When a BURRO goes to work — in the yard or on the line — it delivers fast, low cost performance. Equipped with bucket, magnet, hook, tongs or dragline bucket, a BURRO is ready and able to do the hundreds of odd jobs railroad work calls for. Fast travel speeds (up to 22 mph.) and heavy draw bar pull enable the BURRO to move itself and a work train or cars to the job in a hurry. Once on the job, a BURRO wastes no time getting the work done. BURRO's work power pays dividends every day it operates.

Write for illustrated BURRO Catalogs

CULLEN-FRIESTEDT CO.

1301 S. Kilbourn Ave., Chicago 23, Ill.

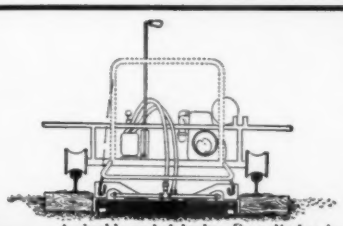
Represented in Canada by:
SYLVESTER STEEL PRODUCTS CO., LTD.
LINDSAY, ONTARIO

NO MORE TRENCHING!

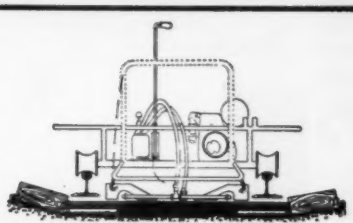
NO MORE JACKING UP TRACK!

This WOOLERY TIE-REMOVING TEAM

NOW ELIMINATES SLOW, COSTLY METHOD



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.



After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.

Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

For highest efficiency two Tie Cutters should be used ahead of one Tie End Remover.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

WOOLERY

MACHINE COMPANY

2919 Como Ave. S. E., Minneapolis 14

GET IN THE GROOVE!
WORLD'S MOST DEPENDABLE... SIMPLEX TRACK JACKS
Featuring non-slip double grooved toes for lining without digging!
• Most complete line — twelve models
• Available with malleable or aluminum alloy housings
• Large area (2½" x 3¼") lifting toe has non-slip grooves
• Lifting ranges from 5 inches to 19¼ inches
• Thumb guards and trips on both sides
• Lowest toe height—less digging or pounding to set jack
WORLD'S LARGEST MFGRS. OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS
SIMPLEX RAIL-ROAD-TOOL UTIL-A-TOOL JERSEY ROL-TOR JACKS
TEMPLETON, KENLY & CO. • 2543 GARDNER RD. • BROADVIEW, ILLINOIS

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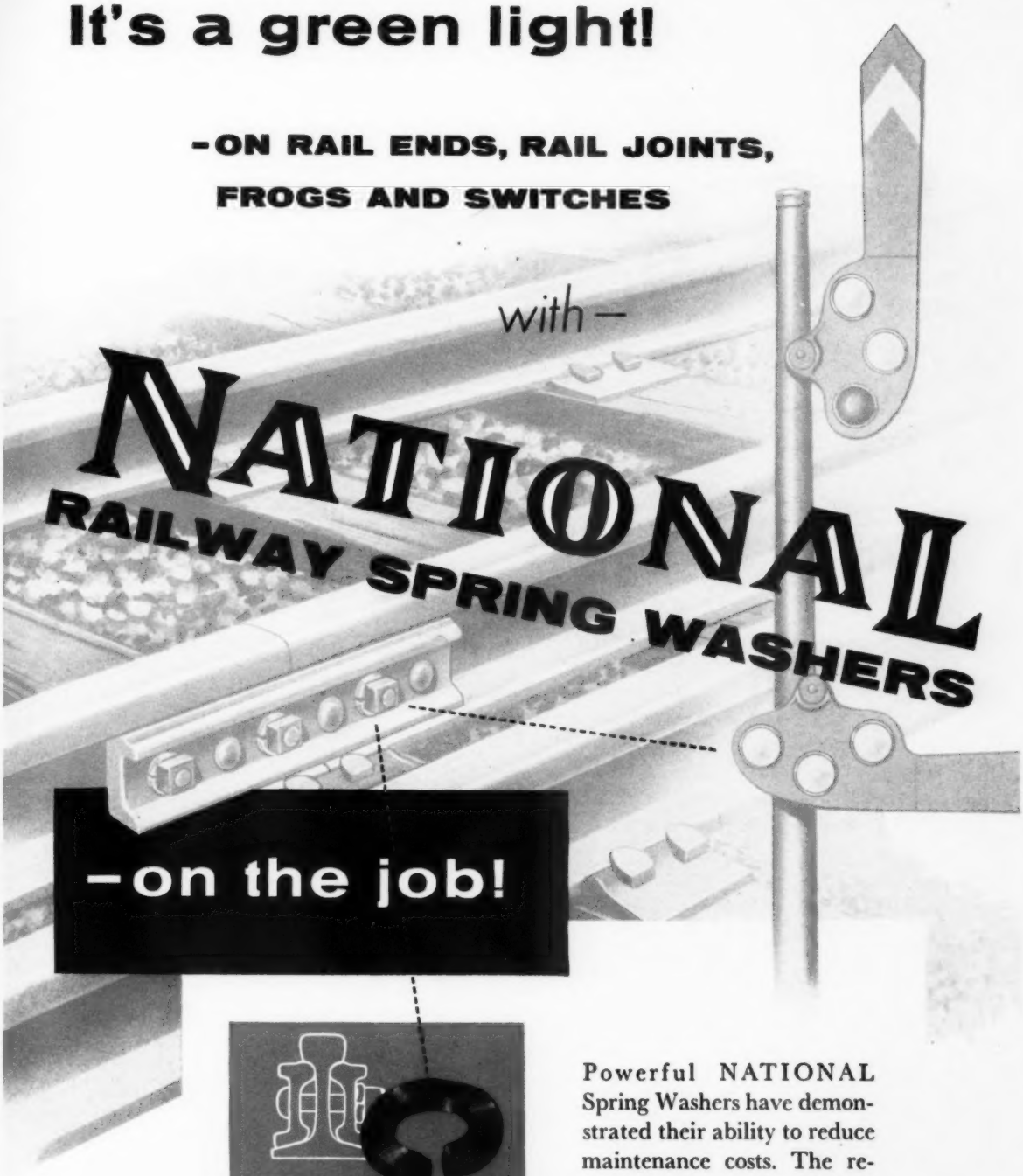
It's a green light!

–ON RAIL ENDS, RAIL JOINTS, FROGS AND SWITCHES

with –

NATIONAL RAILWAY SPRING WASHERS



–on the job!

IMPROVED HORSEPOWERS IMPROVE TRACK

Powerful NATIONAL Spring Washers have demonstrated their ability to reduce maintenance costs. The reserve power, designed into these service-proven spring washers, absorbs shocks and assures constant bolt tension.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

The NATIONAL LOCK WASHER COMPANY

Serving Industry Since 1886 — NEWARK 5, NEW JERSEY, U.S.A.

FIRST, spray Texaco Bridge Cement on upturned surfaces.

Texaco Bridge Cement and pea gravel surface armors bridge ties, stringers, decking and piling against fusees, hot slivers, coals and severe weather almost indefinitely—

THE BRIDGE TIES LAST

SECOND, coat cemented surfaces with clean pea gravel.

here's why:

Texaco Bridge Cement will not chip, peel or become brittle. It seals and stops cracks in ties, waterproofs surfaces. It provides an impenetrable armor for vulnerable bridge surfaces at pennies a tie. Lasts for years.

For full information on this easy, low-cost method of bridge protection, consult a Texaco representative. Call the nearest Texaco Railway Sales Office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta. Or write The Texas Company, *Railway Sales Division*, 135 East 42nd Street, New York 17, N. Y.

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RAILROAD LUBRICANTS AND SYSTEMATIC ENGINEERING SERVICE